YAMAHA

YZF-R1 ’98

4XV1-AE1

SERVICE MANUAL

EB000000

YZF - R1
SERVICE MANUAL
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NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

Yamaha Motor Company, Ltd. is continually striving to improve all of its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:

Designs and specifications are subject to change without notice.

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IMPORTANT MANUAL INFORMATION

Particularly important information is distinguished in this manual by the following.

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the motorcycle operator, a bystander or a person checking or repairing the motorcycle.
CAUTION:	A CAUTION indicates special precautions that must be taken to avoid damage to the motorcycle.
NOTE:	A NOTE provides key information to make procedures easier or clearer.

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HOW TO USE THIS MANUAL

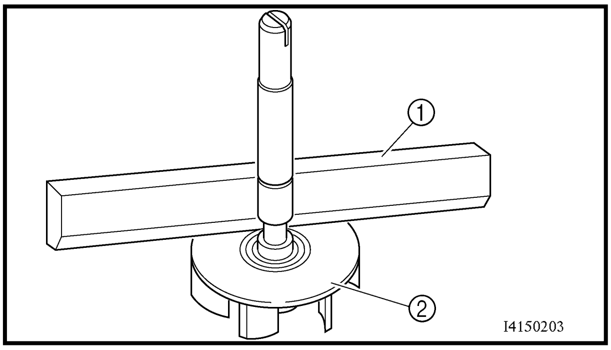
This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.
① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to “SYMBOLS”.

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 (“PERIODIC CHECKS AND ADJUSTMENTS”), where the sub-section title(-s) appears.

③ Sub-section titles appear in smaller print than the section title.

④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

⑤



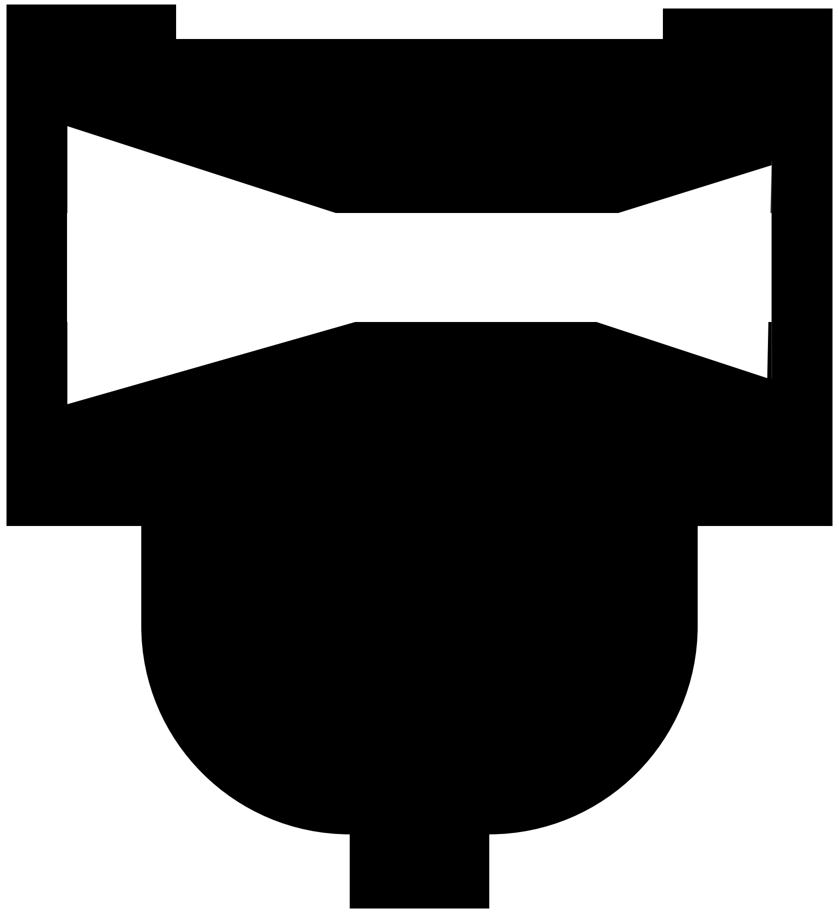
4. Measure:
   - impeller shaft tilt
     Out of specification → Repeat steps (3) and (4).

CAUTION:

Make sure that the rubber damper and rubber damper holder are flush with the impeller.

Max. impeller shaft tilt
0.15 mm

① Straightedge
② Impeller



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CHAPTER 6.
CARBURETORS

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- CHECKING THE CARBURETORS 6-6
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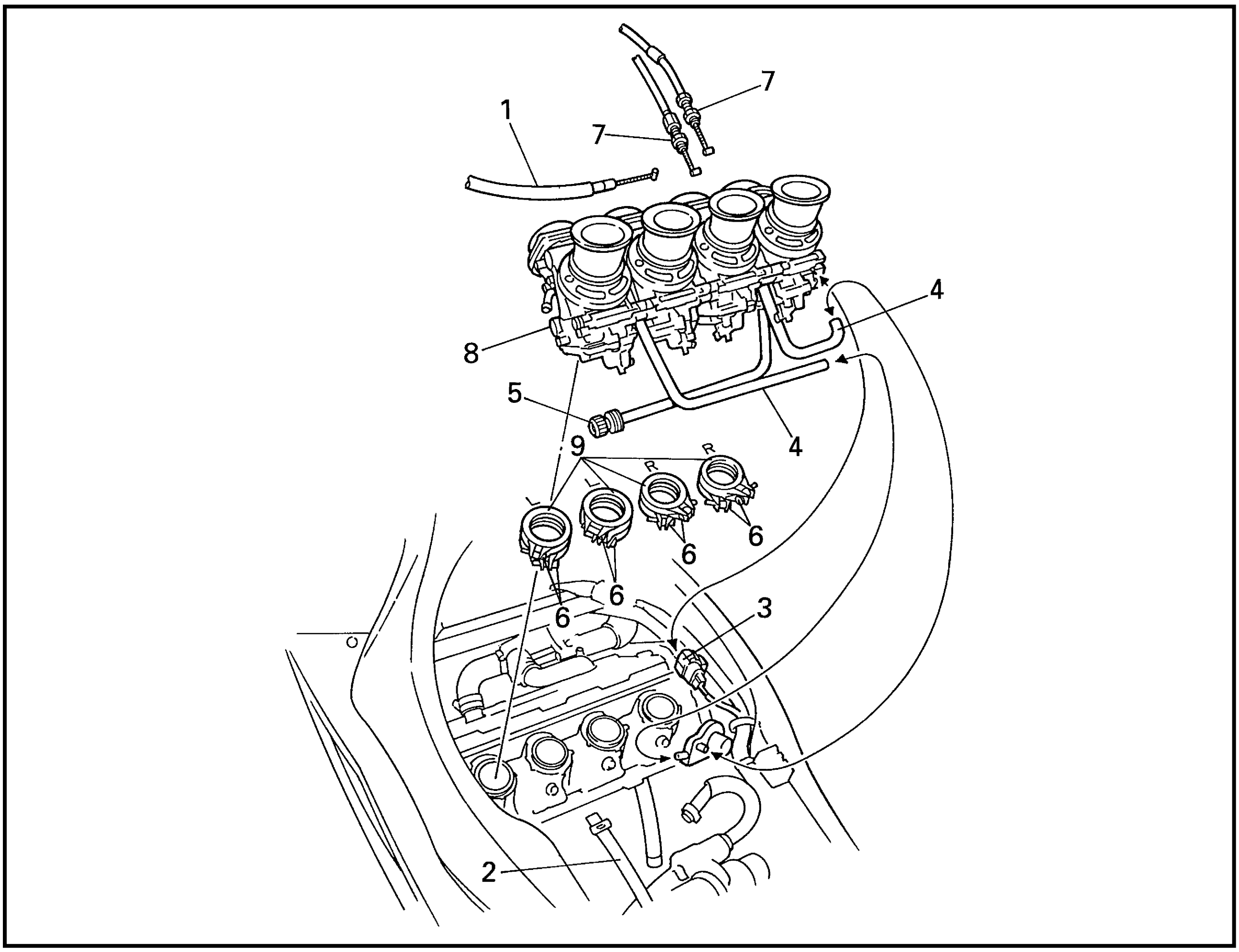
CARBURETORS

CARBURETORS



Order	Job/Part	Q'ty	Remarks
	Removing the carburetors		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Air filter case and rubber baffle		Refer to "AIR FILTER CASE AND IGNITION COIL PLATE" in chapter 3.
1	Starter cable	1	
2	Fuel hose	1	
3	Throttle position sensor coupler	1	Disconnect.
4	Float chamber air vent hose	2	
5	Throttle stop screw	1	
6	Carburetor joint clamp screw	8	
7	Throttle cable	2	
8	Carburetor assembly	1	
9	Carburetor joint	4	
			For installation, reverse the removal procedure.

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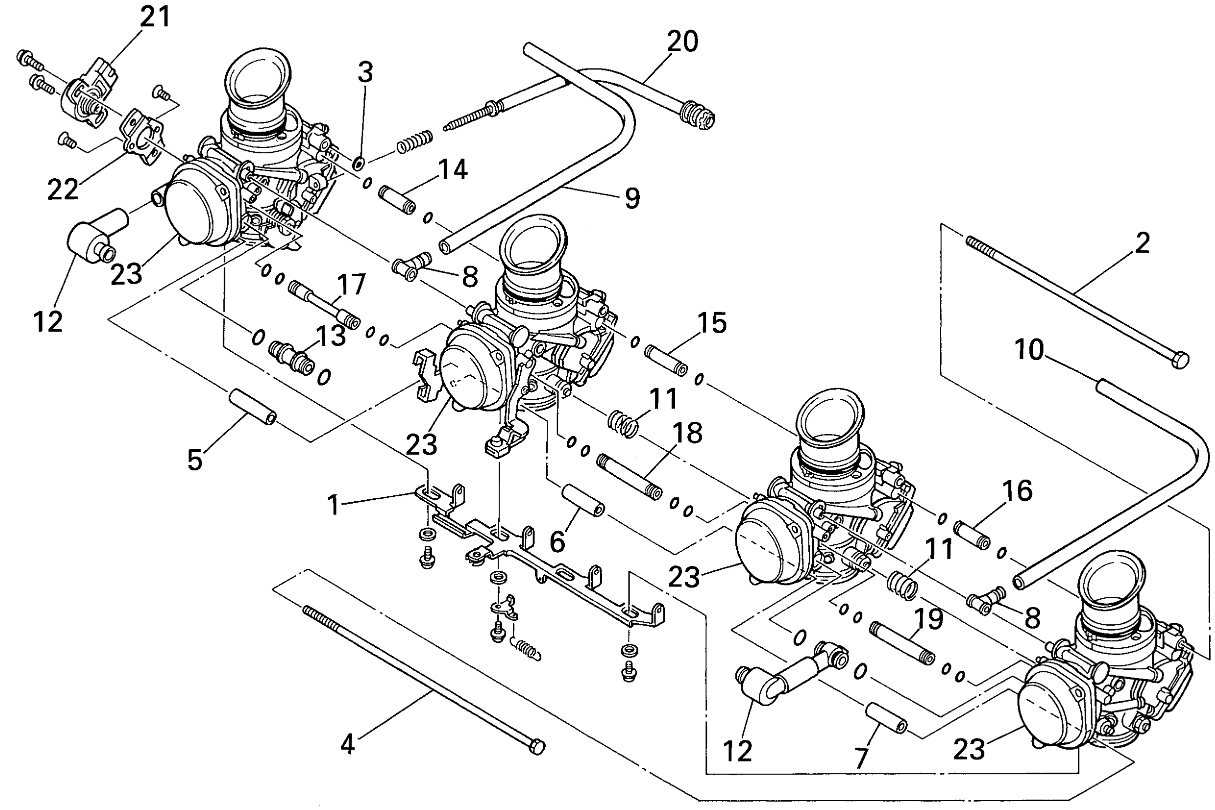
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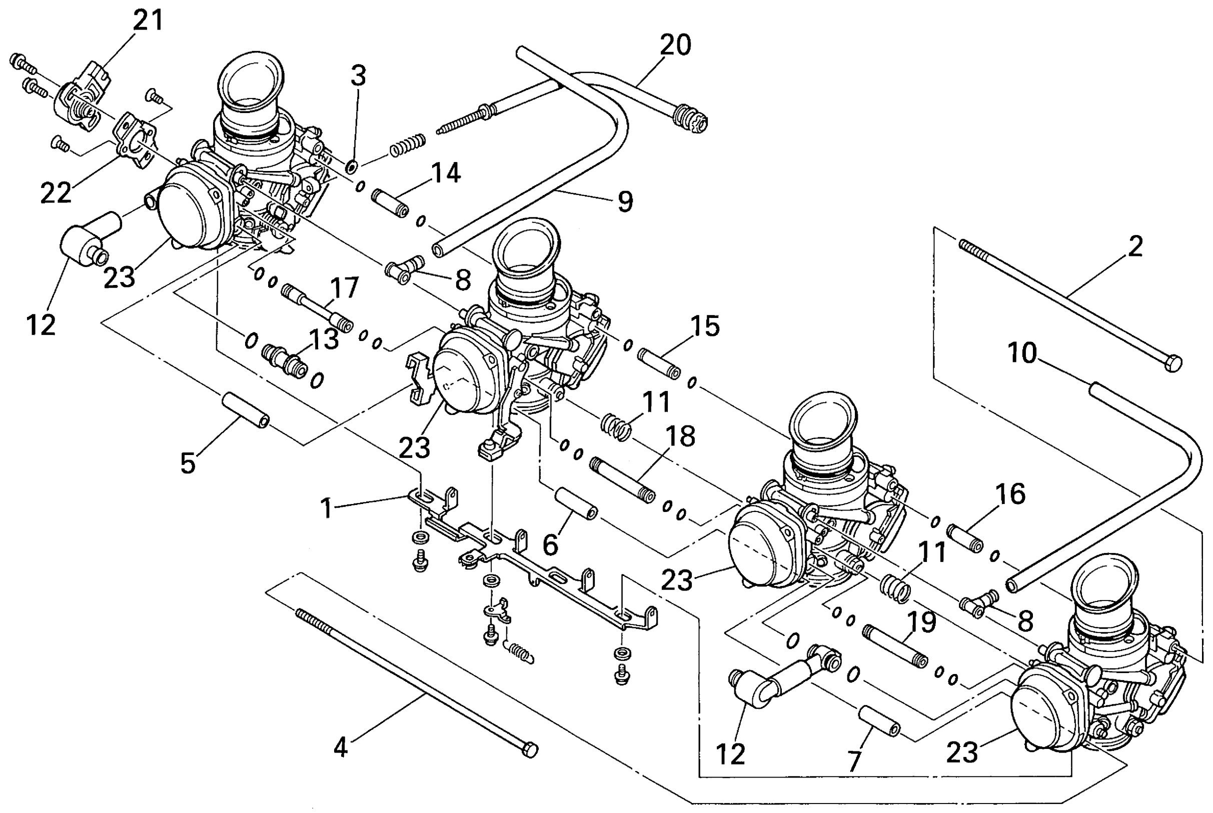
Order	Job/Part	Q'ty	Remarks
	Separating the carburetors		Remove the parts in the order listed.
1	Starter plunger link	1	
2	Connecting bolt	1	ℓ = 245 mm
3	Copper washer	1	
4	Connecting bolt	1	ℓ = 270 mm
5	Spacer	1	ℓ = 43 mm
6	Spacer	1	ℓ = 38 mm
7	Spacer	1	ℓ = 36 mm
8	Hose joint	2	
9	Float chamber air vent hose	1	ℓ = 250 mm
10	Float chamber air vent hose	1	ℓ = 355 mm
11	Spring	2	
12	Vacuum chamber air vent hose	2	
13	Vacuum chamber pipe	1	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Order	Job/Part	Q'ty	Remarks
14	Fuel feed pipe	1	ℓ = 37 mm
15	Fuel feed pipe	1	ℓ = 32 mm
16	Fuel feed pipe	1	ℓ = 29 mm
17	Pipe	1	ℓ = 73 mm
18	Pipe	1	ℓ = 68 mm
19	Pipe	1	ℓ = 66 mm
20	Throttle stop screw	1	
21	Throttle position sensor	1	
22	Throttle position sensor bracket	1	
23	Carburetor	4	
			For installation, reverse the removal procedure.

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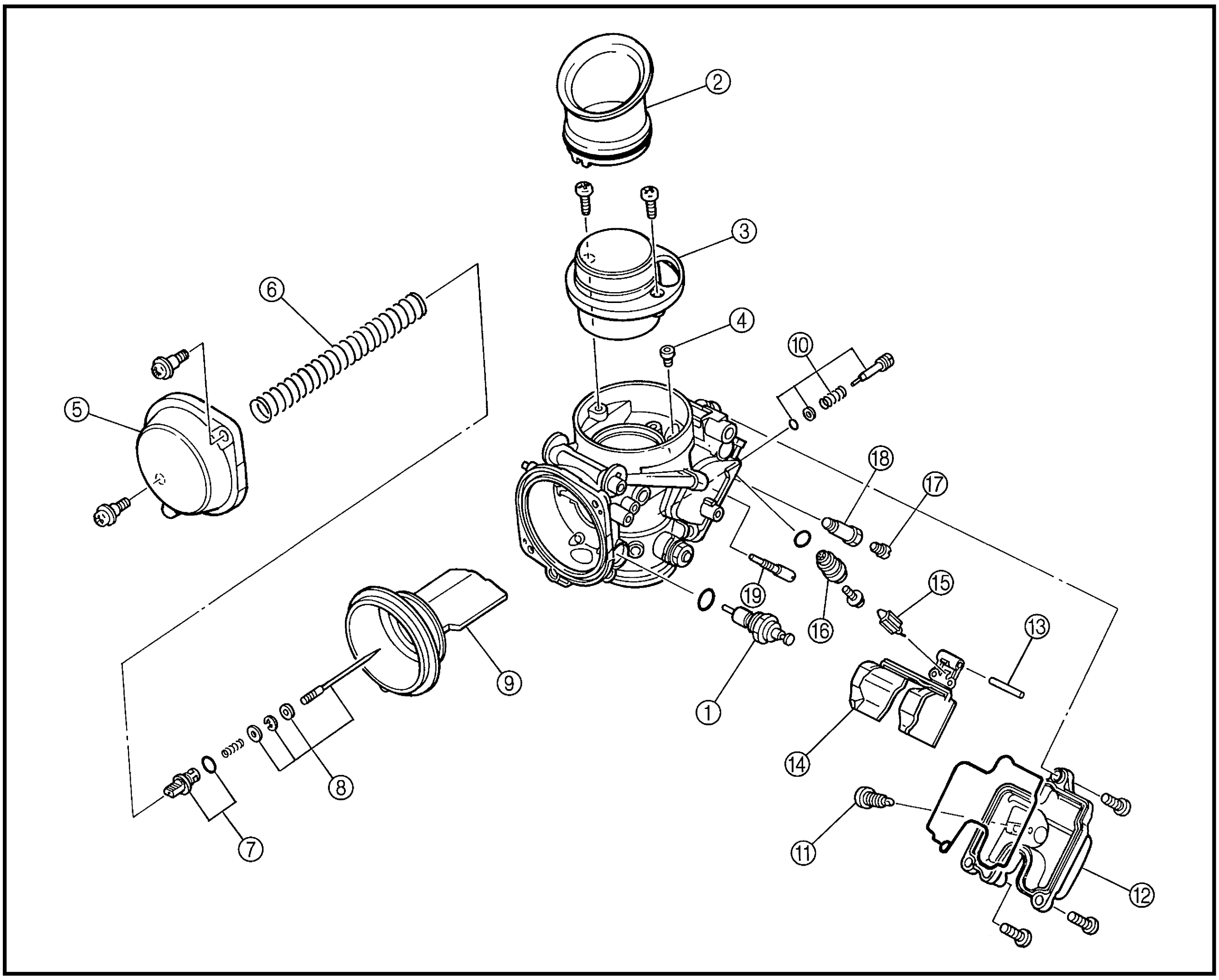
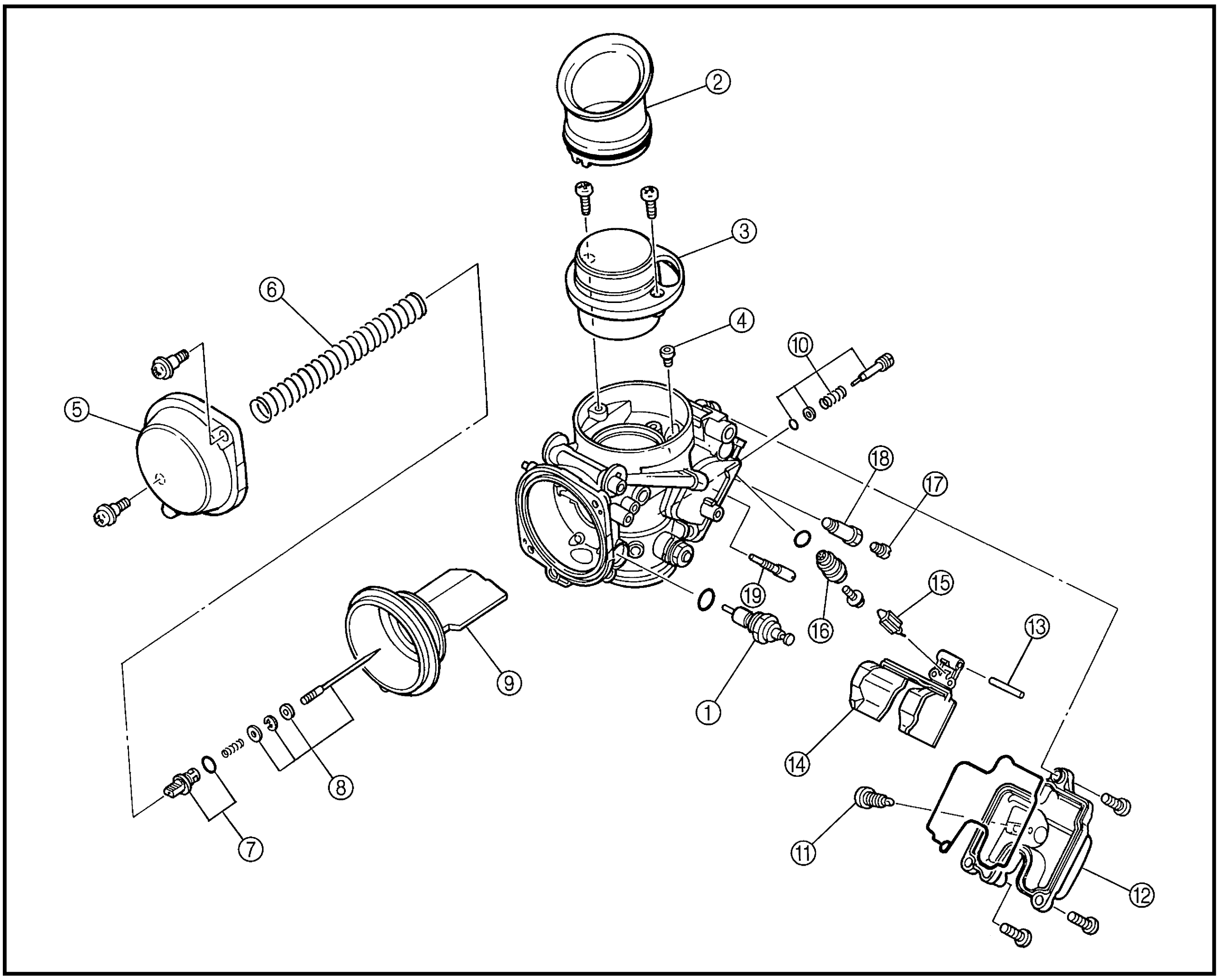


Order	Job/Part	Q'ty	Remarks
	Disassembling the carburetor		Remove the parts in the order listed. **NOTE:** The following procedure applies to all of the carburetors.
①	Starter plunger	1	
②	Air funnel	1	
③	Air funnel joint	1	
④	Pilot air jet	1	
⑤	Vacuum chamber cover	1	
⑥	Piston valve spring	1	
⑦	Jet needle holder	1	
⑧	Jet needle kit	1	
⑨	Piston valve	1	
⑩	Pilot screw	1	
⑪	Fuel drain bolt	1	



Order	Job/Part	Q’ty	Remarks
⑫	Float chamber	1	
⑬	Float pivot pin	1	
⑭	Float	1	
⑮	Needle valve	1	
⑯	Needle valve seat	1	
⑰	Main jet	1	
⑱	Main jet holder	1	
⑲	Pilot jet	1	
			For assembly, reverse the disassembly procedure.

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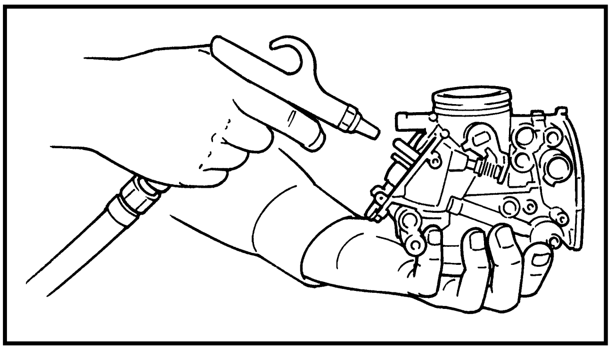
CHECKING THE CARBURETORS

The following procedure applies to all of the carburetors.

1. Check:
   - carburetor body
   - float chamber
     Cracks/damage → Replace.



2. Check:
   - fuel passages
     Obstruction → Clean.

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a. Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solution.

b. Blow out all of the passages and jets with compressed air.

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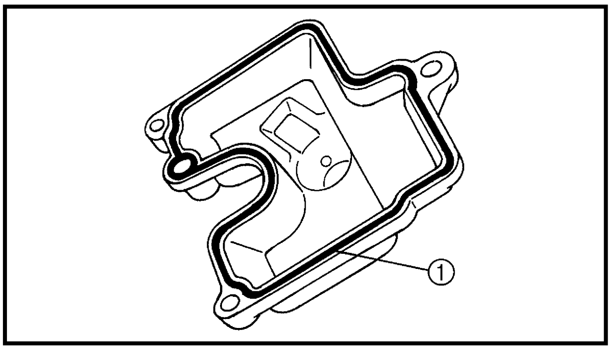
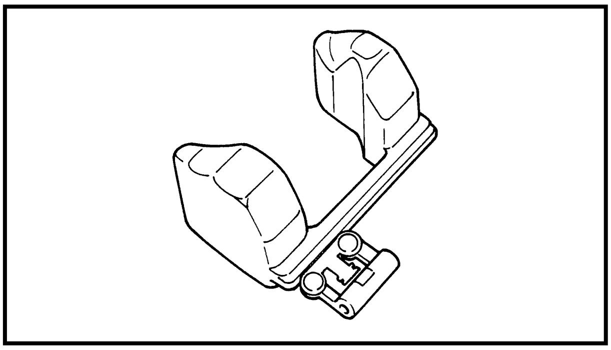
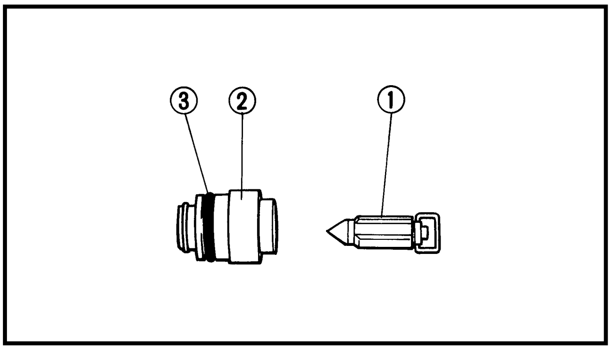


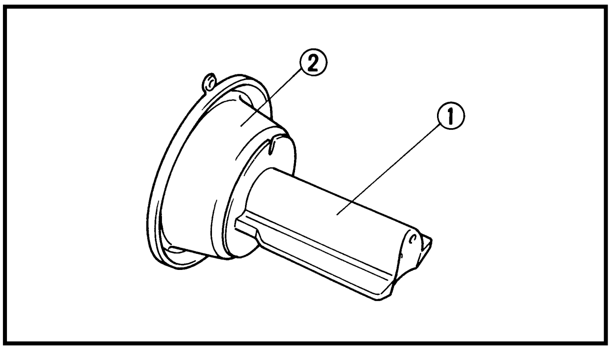
3. Check:
   - float chamber body
     Dirt → Clean.
4. Check:
   - float chamber rubber gasket ①
     Cracks/damage/wear → Replace.



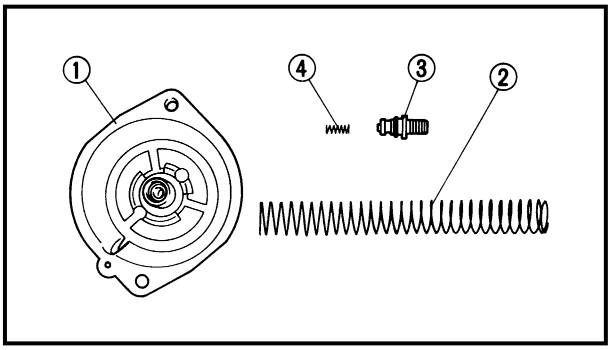
5. Check:
   - float
     Damage → Replace.



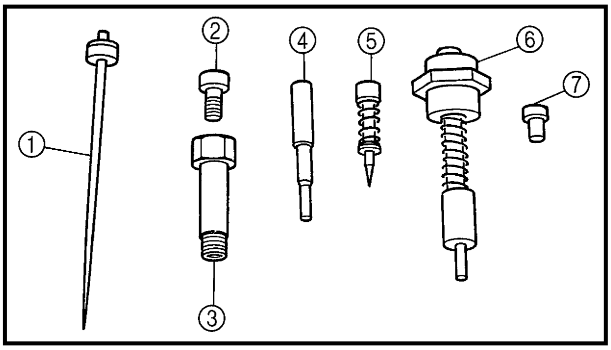
6. Check:
   - needle valve ①
   - needle valve seat ②
     Damage/obstruction/wear → Replace the needle valve, needle valve seat and O-ring as a set.
7. Check:
   - O-ring ③
     Damage/wear → Replace the needle valve, needle valve seat and O-ring as a set.



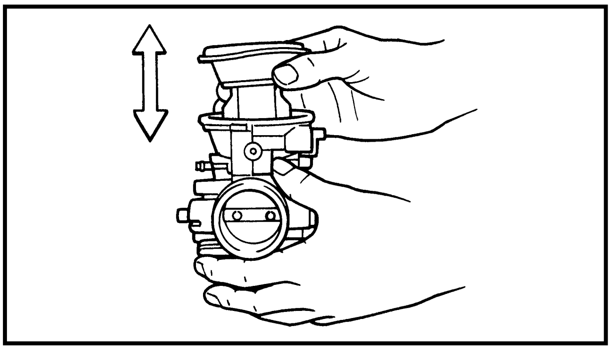
8. Check:
   - piston valve ①
     Damage/scratches/wear → Replace.
   - piston valve diaphragm ②
     Cracks/tears → Replace.



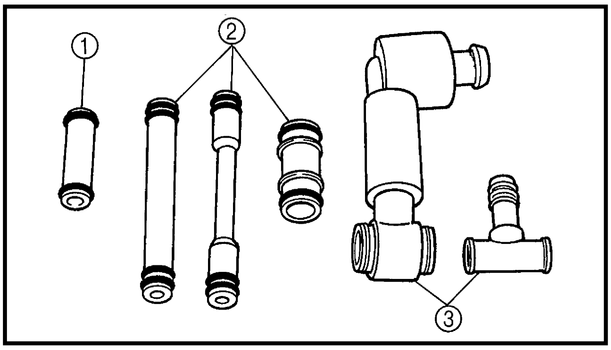
9. Check:
   - vacuum chamber cover ①
   - piston valve spring ②
   - jet needle holder ③
   - jet needle spring ④
     Cracks/damage → Replace.



10. Check:
    - jet needle kit ①
    - main jet ②
    - main jet holder ③
    - pilot jet ④
    - pilot screw ⑤
    - starter plunger ⑥
    - pilot air jet ⑦
      Bends/damage/wear → Replace.
      Obstruction → Clean.
      Blow out the jets with compressed air.



11. Check:
    - piston valve movement
      Insert the piston valve into the carburetor body and move it up and down.
      Tightness → Replace the piston valve.



12. Check:
    - fuel feed pipes ①
    - pipes ②
    - hose joints ③
      Cracks/damage → Replace.
      Obstruction → Clean.
      Blow out the pipes with compressed air.

13. Check:
   - fuel hoses
     Cracks/damage/wear → Replace.
     Obstruction → Clean.
     Blow out the hoses with compressed air.

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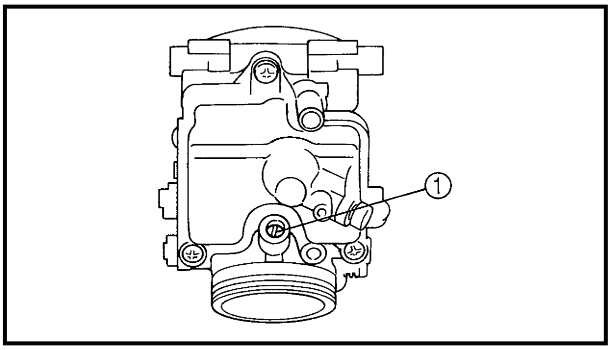
ASSEMBLING THE CARBURETORS

The following procedure applies to all of the carburetors.

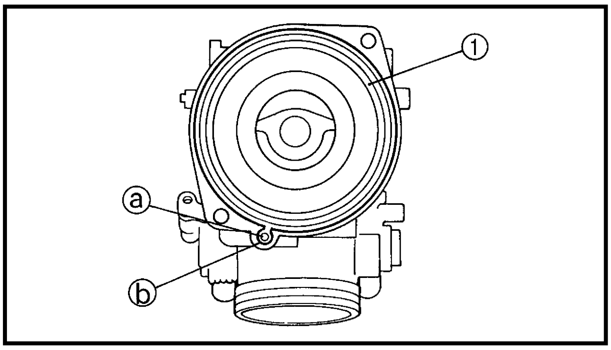
CAUTION:

- **Before assembling the carburetors, wash all of the parts in a petroleum-based solvent.**
- **Always use a new gasket.**



1. Install:
   - pilot screw kit ①

Pilot screw setting
2-1/2 turns out

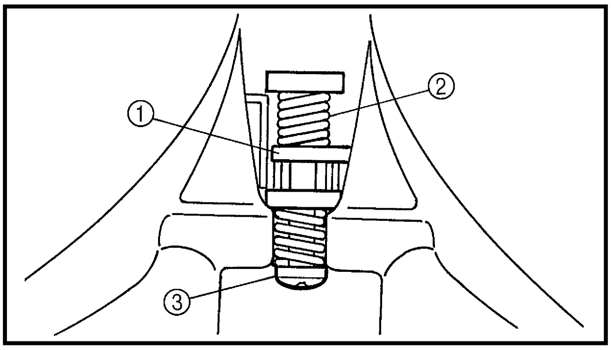


2. Install:
   - piston valve ①
   - jet needle
   - jet needle holder
   - piston valve spring
   - vacuum chamber cover

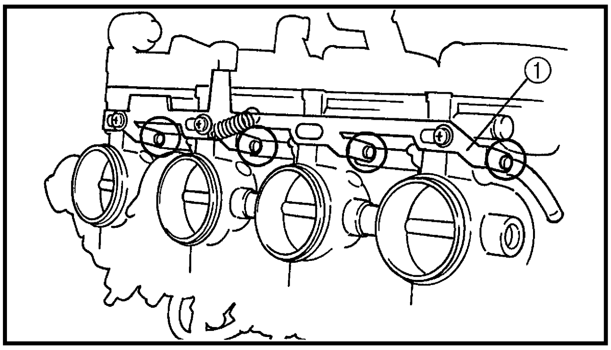
NOTE:

- Install the end of the piston valve spring onto the spring guide on the vacuum chamber cover.
- Align the tab ⓐ on the piston valve diaphragm with the recess ⓑ in the carburetor body.

3. Install:
   - pipes
   - fuel feed pipes
   - vacuum chamber pipe
   - vacuum chamber air vent hose
   - springs
   - float chamber air vent hoses
   - hose joints
   - spacers
   - copper washer
   - connecting bolts



NOTE:
- Do not tighten the connecting bolts, yet.
- Install the throttle valve lever ① onto carburetors #1, #2, and #4 between the spring ② and synchronizing screw ③.

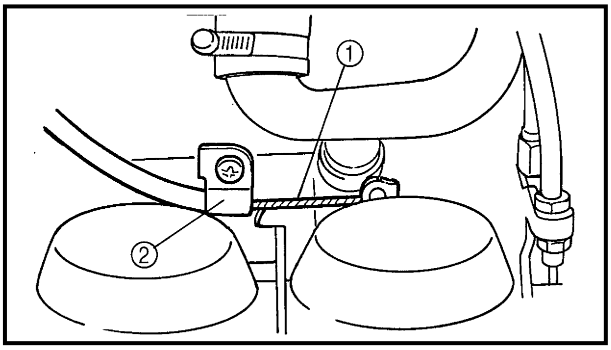


4. Install:
   - starter plunger link ①

NOTE:
Install the starter plunger link ① onto each starter plunger.

5. Tighten:
   - connecting bolts **7 Nm (0.7 m · kg)**

NOTE:
- Place the carburetor assembly on a surface plate with the intake manifold side down. Then, tighten the connecting bolts while pushing down the carburetor assembly with an even force.
- After tightening the connecting bolts, check that the throttle valve lever and starter plunger link operate smoothly.



6. Install:
   - starter cable ①

NOTE:
Install the starter cable holder ② onto the starter cable.

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INSTALLING THE CARBURETORS

1. Adjust:
   - carburetor synchronization
     Refer to "SYNCHRONIZING THE CARBURETORS" in chapter 3.

2. Adjust:
   - engine idling speed

Engine idling speed
1,050 ~ 1,150 r/min

Refer to "ADJUSTING THE ENGINE IDLING SPEED" in chapter 3.

3. Adjust:
   - throttle cable free play

Throttle cable free play (at the flange of the throttle grip)
3 ~ 5 mm

Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

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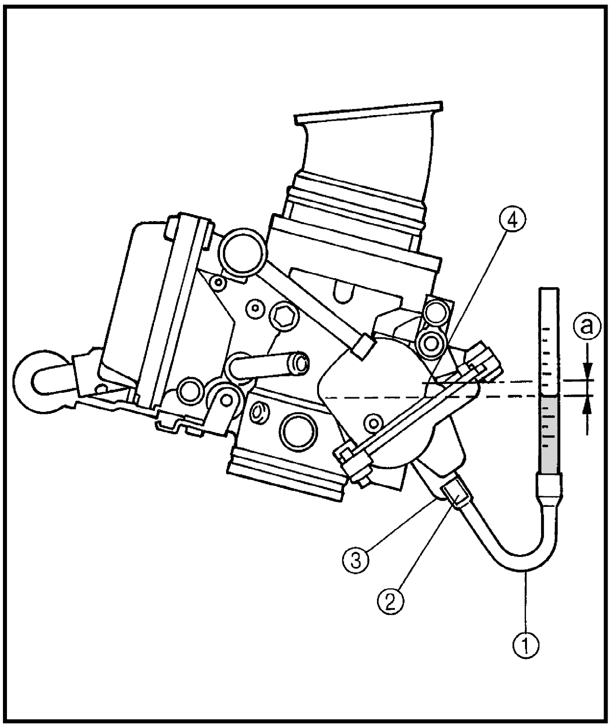
MEASURING AND ADJUSTING THE FUEL LEVEL



1. Measure:
   - fuel level ⓐ
     Out of specification → Adjust.

Fuel level (below the line on the float chamber)
4.1 ~ 5.1 mm

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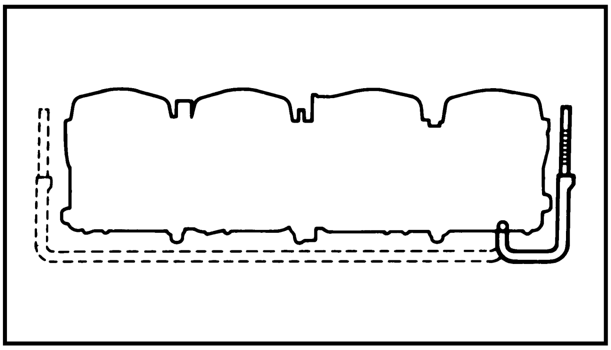
a. Stand the motorcycle on a level surface.

b. Place the motorcycle on a suitable stand to ensure that the motorcycle is standing straight up.

c. Install the fuel level gauge ① onto the fuel drain pipe ②.

Fuel level gauge
90890-01312

d. Loosen the fuel drain bolt ③.



e. Hold the fuel level gauge vertically next to the line ④ on the float chamber.

f. Measure the fuel level ⓐ.

NOTE:
Fuel level readings should be equal on both sides of the carburetor assembly.

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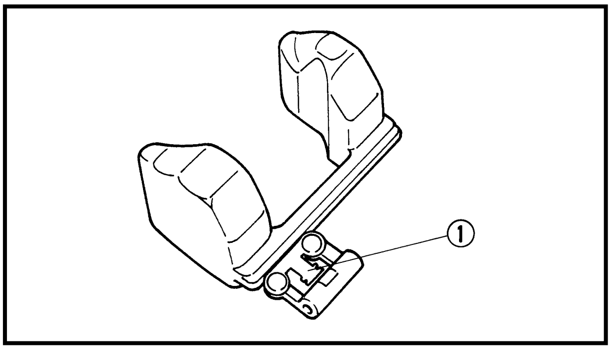

2. Adjust:
   - fuel level

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a. Remove the carburetor assembly.

b. Check the needle valve seat and needle valve.

c. If either is worn, replace them as a set.

d. If both are fine, adjust the float level by slightly bending the float tang ①.

e. Install the carburetor assembly.

f. Measure the fuel level again.

g. Repeat steps (a) to (f) until the fuel level is within specification.

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CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR

NOTE:

Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.

1. Check:
   - throttle position sensor (installed on the carburetor)

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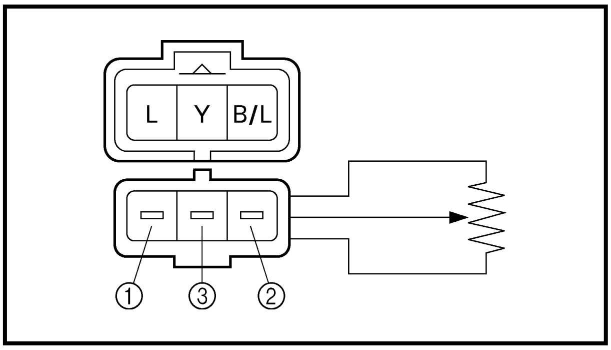

a. Disconnect the throttle position sensor coupler.

b. Connect the pocket tester (Ω × 1k) to the throttle position sensor.

Tester positive probe → blue ①
Tester negative probe → black/blue ②

c. Measure the throttle position sensor maximum resistance.
Out of specification → Replace the throttle position sensor.

Throttle position sensor maximum resistance
4.0 ~ 6.0 kΩ at 20 °C
(blue — black/blue)

d. Connect the pocket tester (Ω × 1k) to the throttle position sensor.

Tester positive probe → yellow ③
Tester negative probe → black/blue ②

e. While slowly opening the throttle, check that the throttle position sensor resistance is within the specified range.

NOTE:

Check mainly that the resistance changes gradually when turning the throttle, since the readings (from closed to wide-open throttle) may differ slightly from those specified.

Out of specification or the resistance changes abruptly → Go to step (2).

Throttle position sensor resistance
0 ~ 5 ± 1.0 kΩ at 20 °C
(yellow — black/blue)

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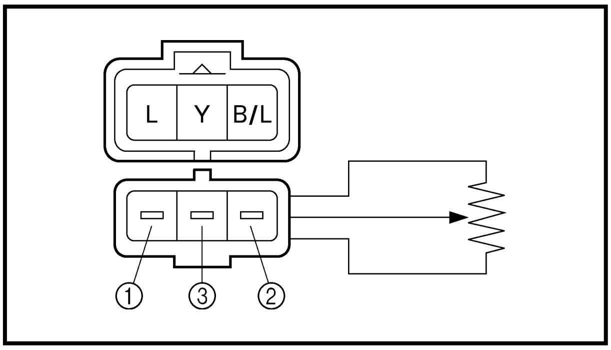

2. Check:
   - throttle position sensor
     (removed from the carburetor)

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a. Disconnect the throttle position sensor coupler.

b. Remove the throttle position sensor from the carburetor.

c. Connect the pocket tester (Ω × 1k) to the throttle position sensor.

Tester positive probe → blue ①
Tester negative probe → black/blue ②

d. Measure the throttle position sensor maximum resistance.
Out of specification → Replace the throttle position sensor.

Throttle position sensor maximum resistance
4.0 ~ 6.0 kΩ at 20 °C
(blue — black/blue)

e. Connect the pocket tester (Ω × 1k) to the throttle position sensor coupler.

Tester positive probe → yellow ③
Tester negative probe → black/blue ②

f. While slowly opening the throttle, check that the throttle position sensor resistance is within the specified range.

The resistance does not change or it changes abruptly → Replace the throttle position sensor.
The slot is worn or broken → Replace the throttle position sensor.

NOTE:
Check mainly that the resistance changes gradually when turning the throttle, since the readings (from closed to wide-open throttle) may differ slightly from those specified.

Throttle position sensor resistance
0 ~ 5 ± 1.0 kΩ at 20 °C
(yellow — black/blue)

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3. Adjust:
   - throttle position sensor angle

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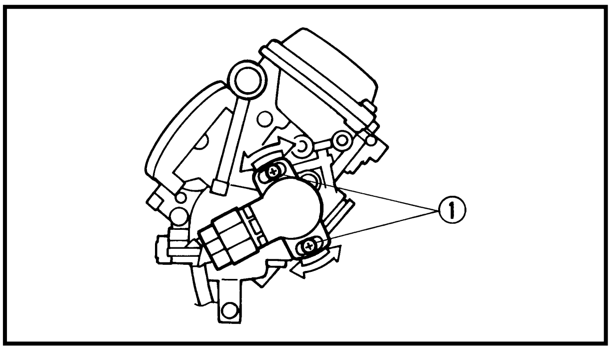
a. Set the main switch to “ON”.

b. Disconnect the throttle position sensor coupler.

c. Reconnect the throttle position sensor coupler.

NOTE:

After reconnecting the throttle position sensor coupler, the tachometer switches to the throttle position sensor adjustment mode.

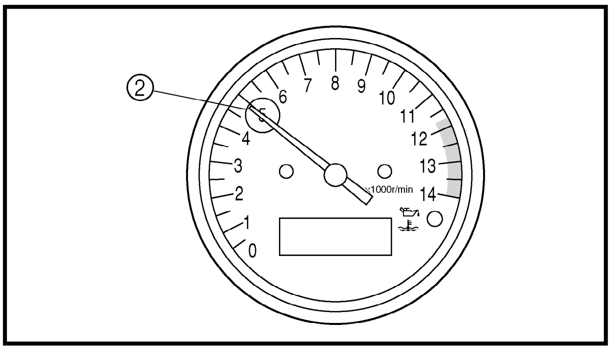


d. Loosen the throttle position sensor screws ①.

e. Adjust the throttle position sensor angle according to the following table.

NOTE:

The angle of the throttle position sensor is indicated by the r/min which are displayed on the tachometer.



Tachometer reading	Throttle position sensor angle
0 r/min	**Too small**
5,000 r/min ②	**Correct**
10,000 r/min	**Too large**

f. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.

NOTE:

To exit the throttle position sensor adjustment mode, start the engine or set the main switch to “OFF”.

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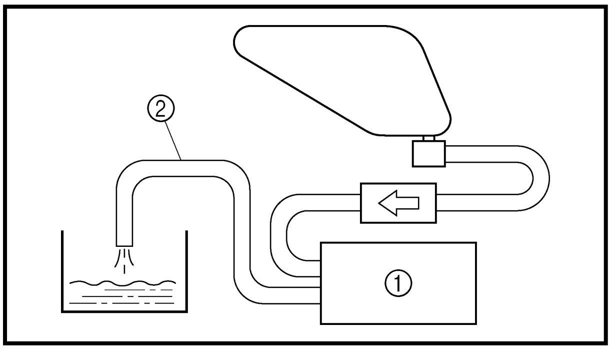

EB600090

CHECKING THE FUEL PUMP

1. Check:
   - fuel pump ①

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a. Remove the fuel tank.
   Refer to "FUEL TANK" in chapter 3.

b. Disconnect the fuel-pump-to-carburetor fuel hose ② from the carburetor.

c. Connect the fuel-tank-to-fuel-pump fuel hose to the fuel tank and then set the fuel cock to "ON".

d. Place a container under the end of the fuel hose ②.

e. Start the engine and check if fuel flows from the fuel hose ②.

Fuel flows.	**Fuel pump is OK.**
Fuel does not flow.	**Replace the fuel pump.**

f. Stop the engine and check if the fuel stops flowing from the fuel hose ②.

Fuel stops flowing.	**Fuel pump is OK.**
Fuel flows.	**Replace the fuel pump.**

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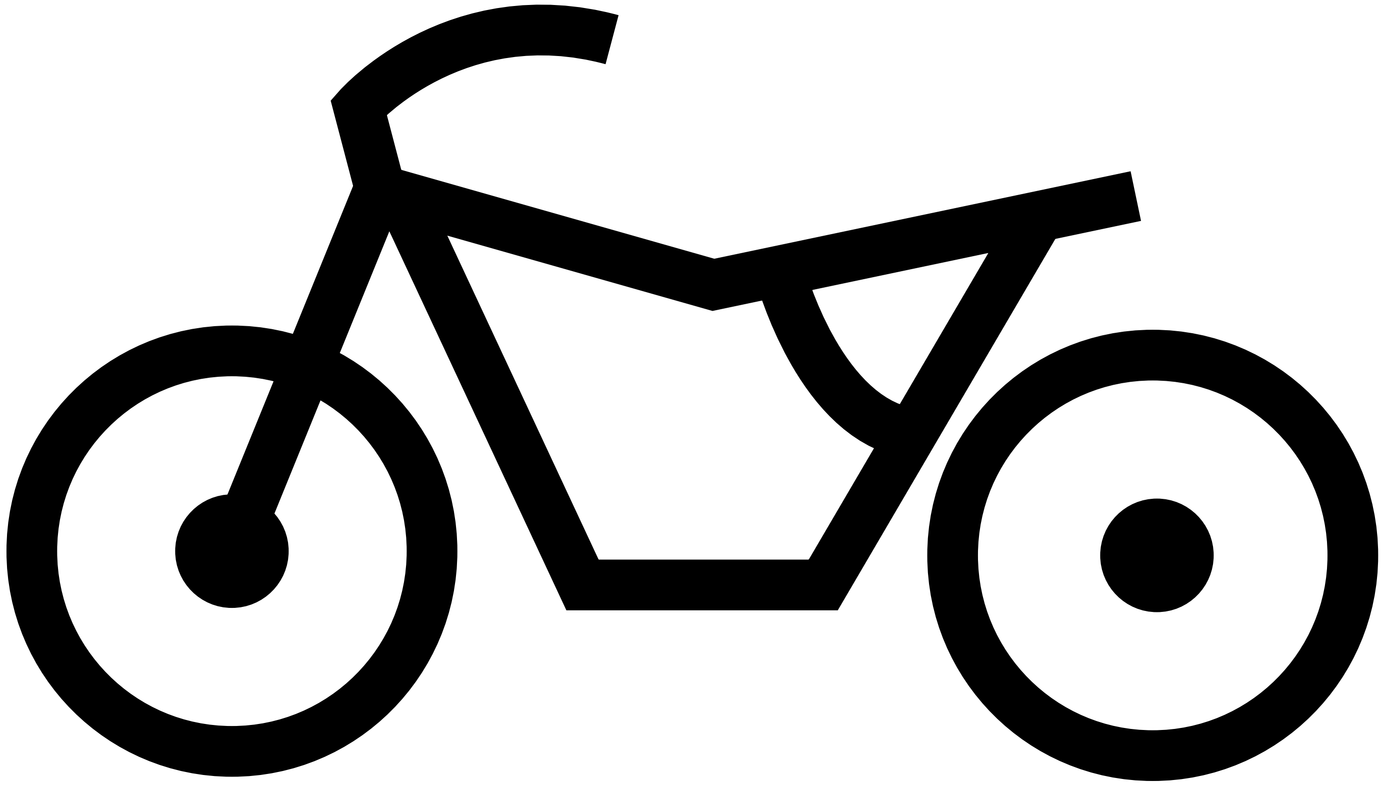

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CHAPTER 7.
CHASSIS

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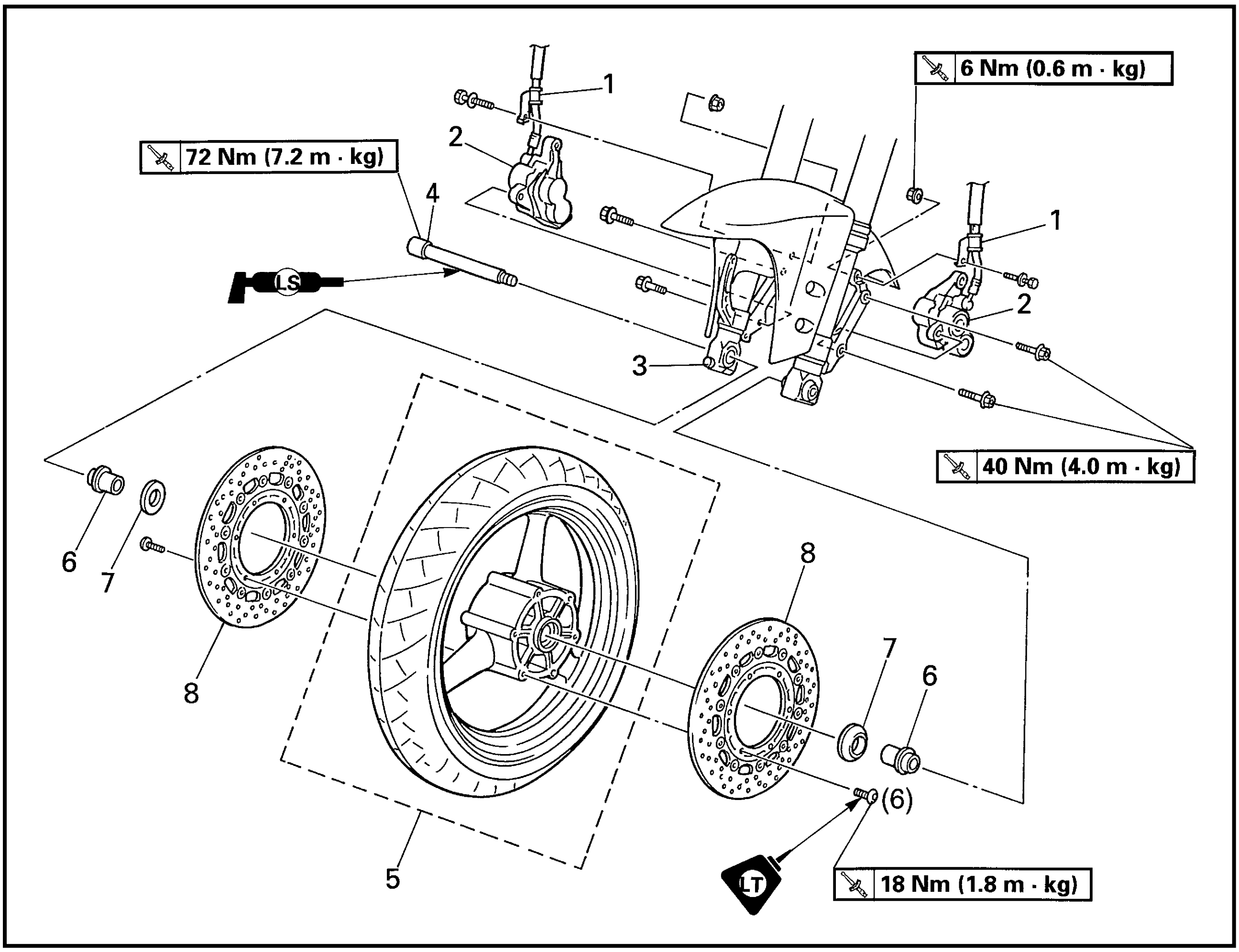
EB700002

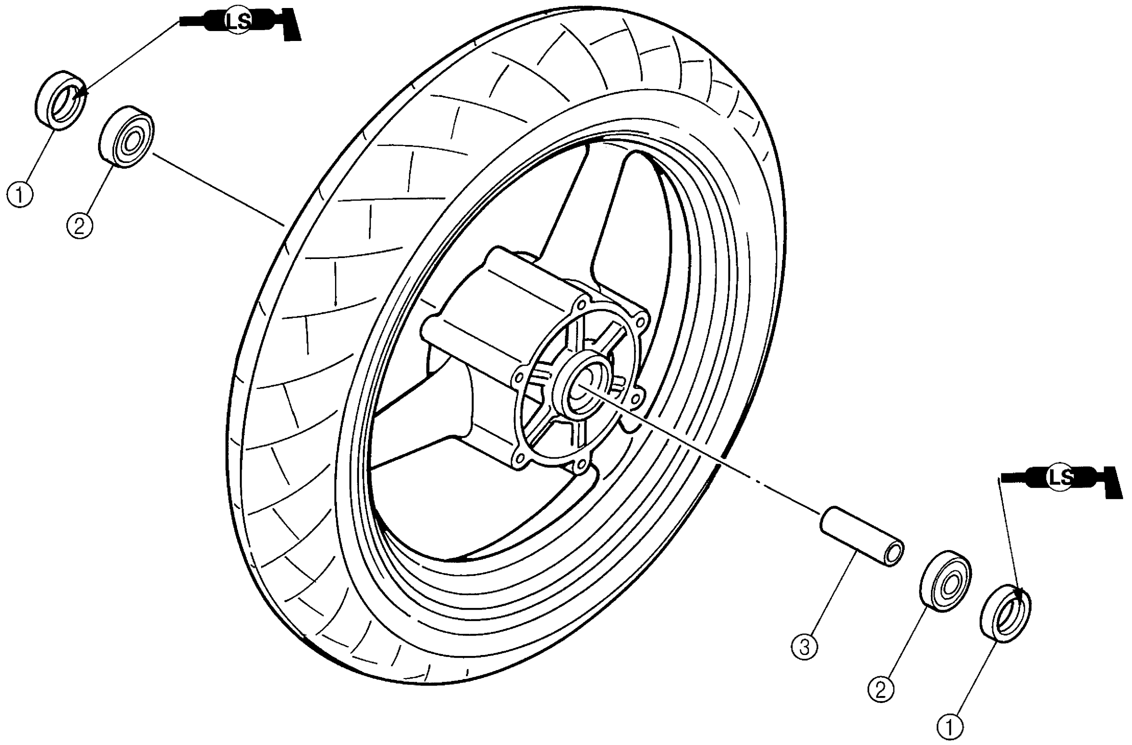
CHASSIS

FRONT WHEEL AND BRAKE DISCS


1
2
72 Nm (7.2 m · kg)
4
LS
6 Nm (0.6 m · kg)
1
2
3
40 Nm (4.0 m · kg)
6
7
8
8
7
6
(6)
5
LT
18 Nm (1.8 m · kg)

Order	Job/Part	Q'ty	Remarks
	Removing the front wheel and brake discs		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the front wheel is elevated.
1	Brake hose holder (left and right)	2	
2	Brake caliper (left and right)	2	
3	Wheel axle pinch bolt	1	Loosen.
4	Front wheel axle	1	
5	Front wheel	1	
6	Collar (left and right)	2	
7	Oil seal cover (left and right)	2	
8	Brake disc (left and right)	2	
			For installation, reverse the removal procedure.

EB700010



Order	Job/Part	Q'ty	Remarks
	Disassembling the front wheel		Remove the parts in the order listed.
①	Oil seal (left and right)	2	
②	Wheel bearing (left and right)	2	
③	Spacer	1	
			For assembly, reverse the disassembly procedure.

EB700102

REMOVING THE FRONT WHEEL

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

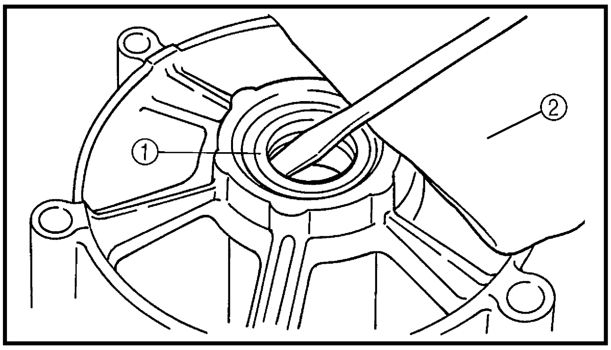
NOTE:
Place the motorcycle on a suitable stand so that the front wheel is elevated.

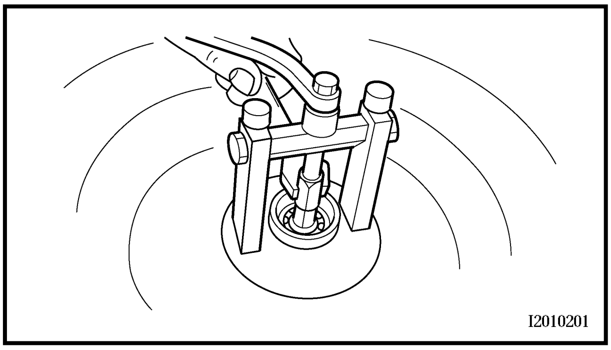
2. Remove:
   - left brake caliper
   - right brake caliper

NOTE:
Do not squeeze the brake lever when removing the brake calipers.

3. Elevate:
   - front wheel

NOTE:
Place the motorcycle on a suitable stand so that the front wheel is elevated.





EB700110

DISASSEMBLING THE FRONT WHEEL

1. Remove:
   - oil seals
   - wheel bearings

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a. Clean the outside of the front wheel hub.

b. Remove the oil seals ① with a flat-head screwdriver.

NOTE:
To prevent damaging the wheel, place a rag ② between the screwdriver and the wheel surface.

c. Remove the wheel bearings with a general bearing puller.

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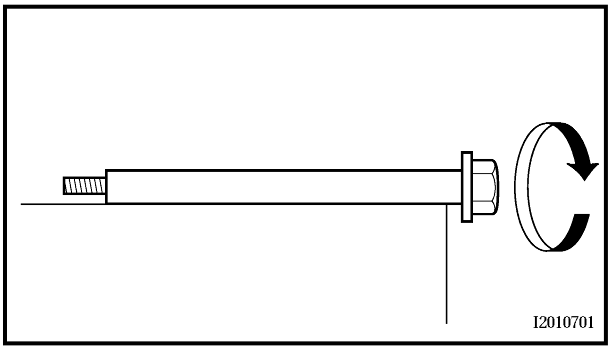


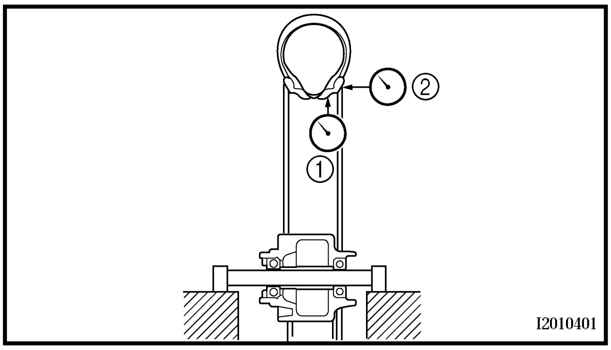
EB700400
CHECKING THE FRONT WHEEL

1. Check:
   - wheel axle
     Roll the wheel axle on a flat surface.
     Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent wheel axle.

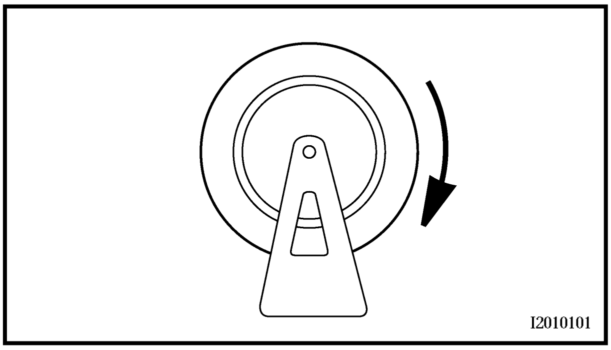
2. Check:
   - tire
   - front wheel
     Damage/wear → Replace.
     Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.

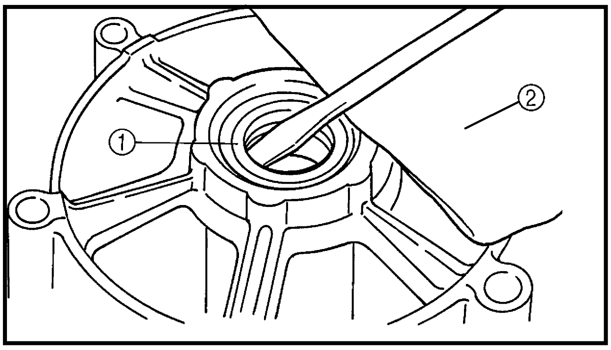


3. Measure:
   - radial wheel runout ①
   - lateral wheel runout ②
     Over the specified limits → Replace.

Max. radial wheel runout
1.0 mm
Max. lateral wheel runout
0.5 mm

4. Check:
   - wheel bearings
     Front wheel turns roughly or is loose → Replace the wheel bearings.
   - oil seals
     Damage/wear → Replace.





5. Replace:
   - wheel bearings **New**
   - oil seals **New**

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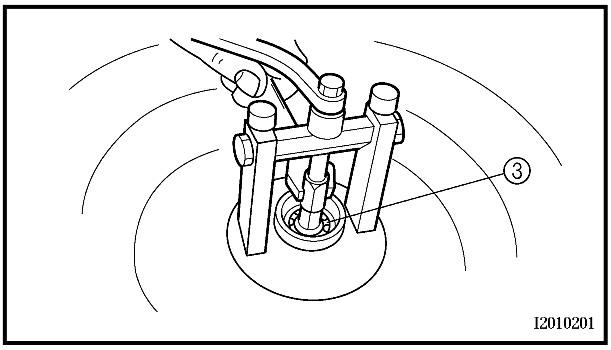
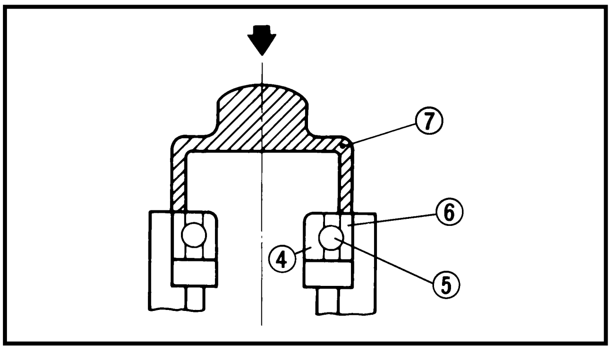
a. Clean the outside of the front wheel hub.

b. Remove the oil seals ① with a flat-head screwdriver.

NOTE:

To prevent damaging the wheel, place a rag ② between the screwdriver and the wheel surface.





c. Remove the wheel bearings ③ with a general bearing puller.

d. Install the new wheel bearings and oil seals in the reverse order of disassembly.

CAUTION:

Do not contact the wheel bearing center race ④ or balls ⑤. Contact should be made only with the outer race ⑥.

NOTE:

Use a socket ⑦ that matches the diameter of the wheel bearing outer race and oil seal.

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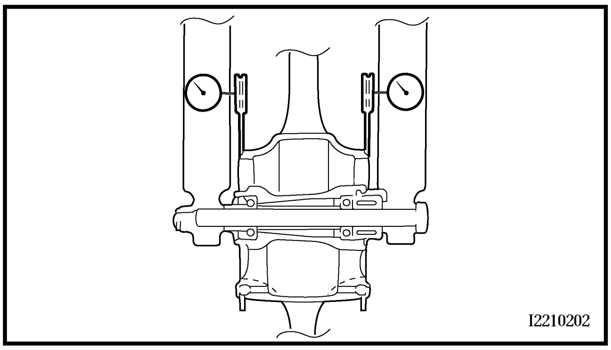
EB700416

CHECKING THE BRAKE DISCS

The following procedure applies to both of the brake discs.

1. Check:
   - brake disc
     Damage/galling → Replace.
2. Measure:
   - brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.



Max. brake disc deflection
Front: 0.1 mm
Rear: 0.1 mm

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a. Place the motorcycle on a suitable stand so that the wheel is elevated.

b. Before measuring the front brake disc deflection, turn the handlebars to the left or right to ensure that the front wheel is stationary.

c. Remove the brake caliper.

d. Hold the dial gauge at a right angle against the brake disc surface.

e. Measure the deflection 2 ~ 3 mm below the edge of the brake disc.

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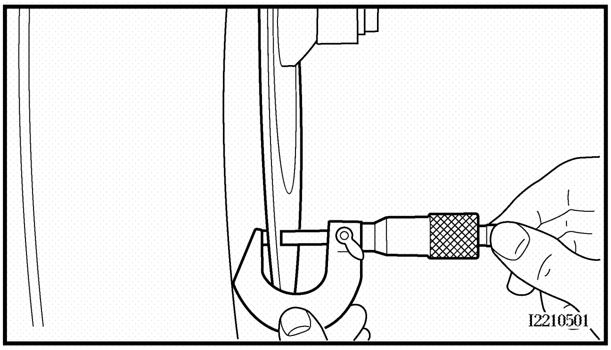
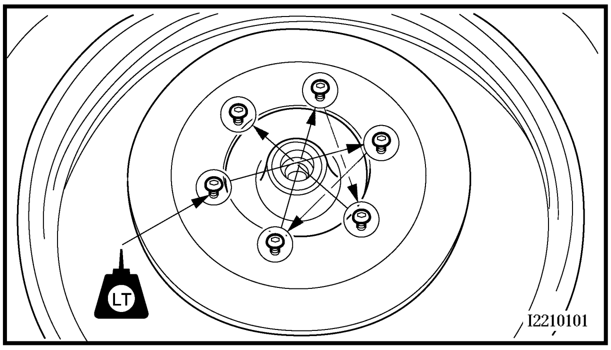


3. Measure:
   - brake disc thickness

   Measure the brake disc thickness at a few different locations.
   Out of specification → Replace.

Min. brake disc thickness
Front: 4.5 mm
Rear: 4.5 mm



4. Adjust:
   - brake disc deflection

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a. Remove the brake disc.

b. Rotate the brake disc by one bolt hole.

c. Install the brake disc.

NOTE:
Tighten the brake disc bolts in stages and in a crisscross pattern.

Brake disc bolt
18 Nm (1.8 m • kg)
LOCTITE®

d. Measure the brake disc deflection.

e. If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.

f. If the brake disc deflection cannot be brought within specification, replace the brake disc.

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EB700711
ASSEMBLING THE FRONT WHEEL

1. Install:
   - wheel bearings
   - oil seals New

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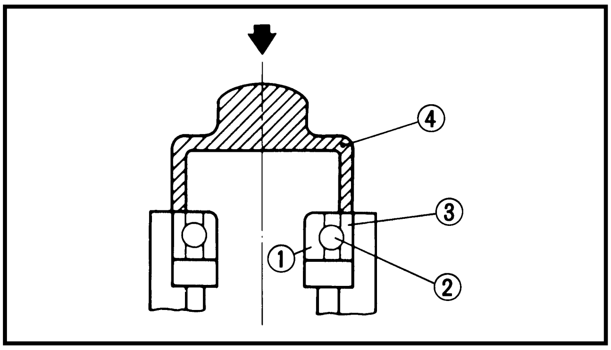
a. Install the new wheel bearings and oil seals in the reverse order of disassembly.



CAUTION:

Do not contact the wheel bearing center race ① or balls ②. Contact should be made only with the outer race ③.

NOTE:
Use a socket ④ that matches the diameter of the wheel bearing outer race and oil seal.

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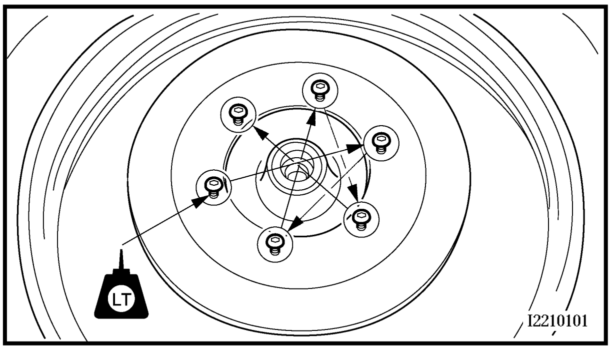
EB700725
INSTALLING THE FRONT WHEEL

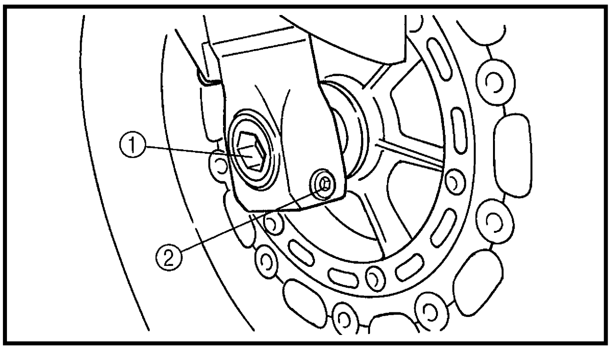
1. Lubricate:
   - wheel axle
   - oil seal lips

━■	**Recommended lubricant** **Lithium soap base grease**



2. Install:
   - brake discs **18 Nm (1.8 m · kg)**

NOTE:
- Apply LOCTITE® 648 to the threads of the brake disc bolts.
- Tighten the brake disc bolts in stages and in a crisscross pattern.



3. Tighten:
   - wheel axle ① **72 Nm (7.2 m · kg)**
   - wheel axle pinch bolt ② **23 Nm (2.3 m · kg)**

CAUTION:

Before tightening the wheel axle nut, push down hard on the handlebars several times and check if the front fork rebounds smoothly.

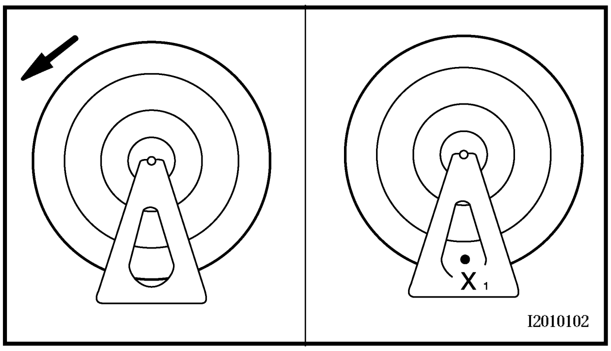
4. Install:
   - brake calipers **40 Nm (4.0 m · kg)**

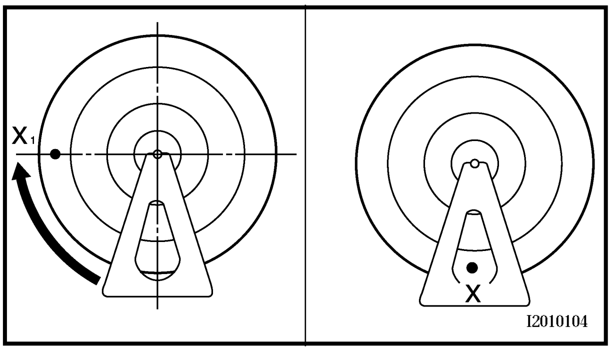
⚠ WARNING

Make sure that the brake hose is routed properly.

EB700901
ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:
- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake discs installed.





1. Remove:
   - balancing weight(-s)
2. Find:
   - front wheel's heavy spot

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a. Place the front wheel on a suitable balancing stand.

b. Spin the front wheel.

c. When the front wheel stops, put an "X_1" mark at the bottom of the wheel.

d. Turn the front wheel 90° so that the "X_1" mark is positioned as shown.

e. Release the front wheel.

f. When the front wheel stops, put an "X_2" mark at the bottom of the wheel.

g. Repeat steps (a) through (d) several times until all the marks come to rest at the same spot.

h. The spot where all the marks come to rest is the front wheel's heavy spot "X".

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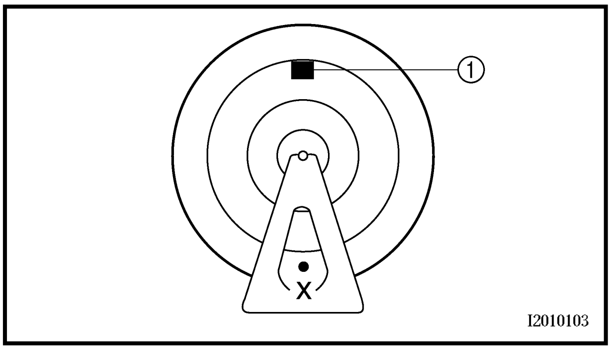

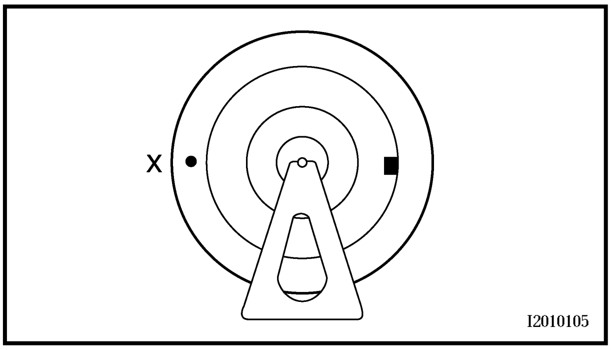

3. Adjust:
   - front wheel static balance

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a. Install a balancing weight ① onto the rim exactly opposite the heavy spot "X".

NOTE:
Start with the lightest weight.

b. Turn the front wheel 90° so that the heavy spot is positioned as shown.

c. If the heavy spot does not stay in that position, install a heavier weight.

d. Repeat steps (b) and (c) until the front wheel is balanced.

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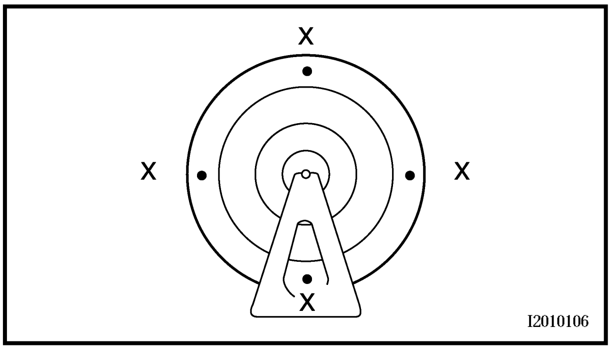

4. Check:
   - front wheel static balance

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a. Turn the front wheel and make sure that it stays at each position shown.

b. If the front wheel does not remain stationary at all of the positions, rebalance it.

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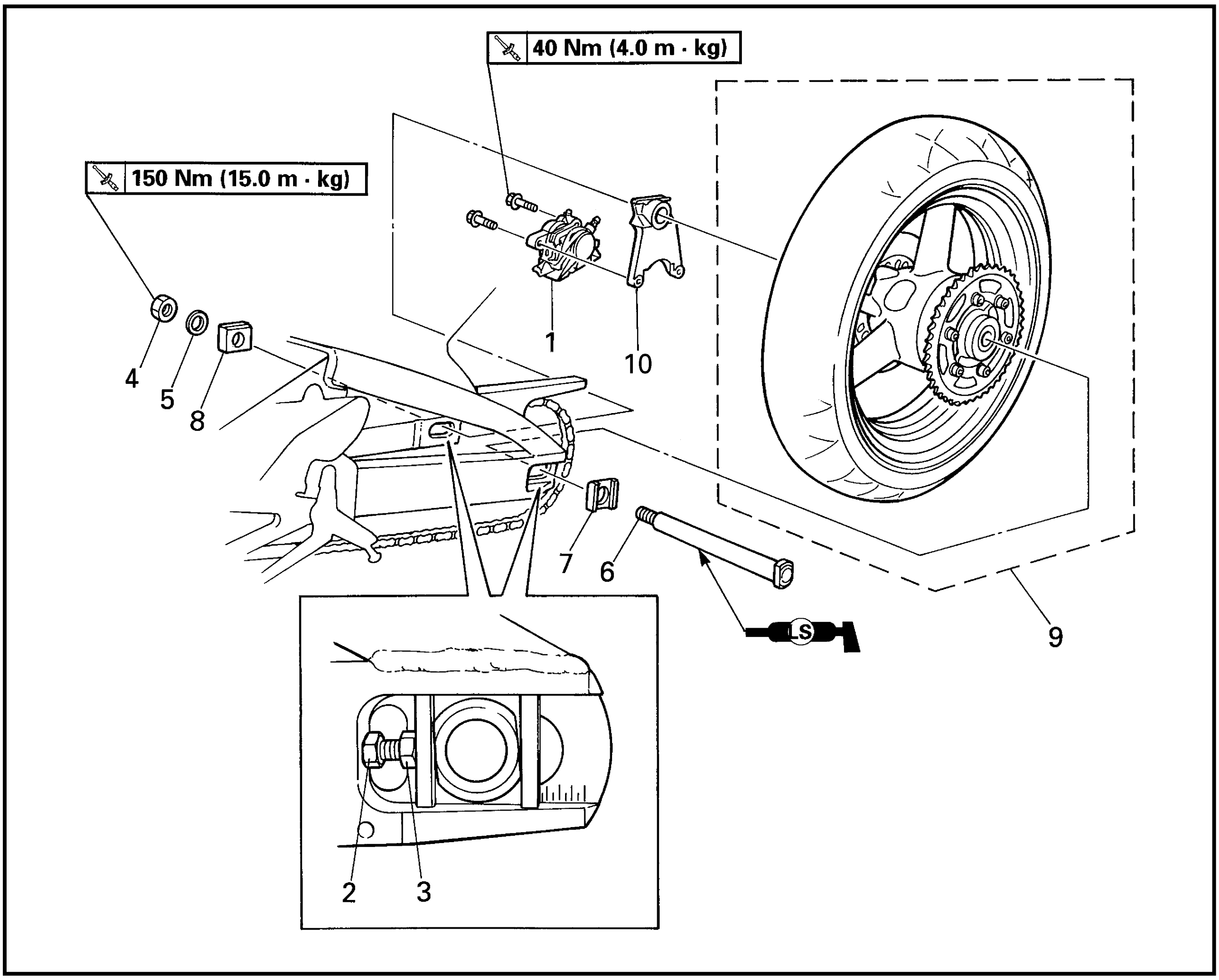
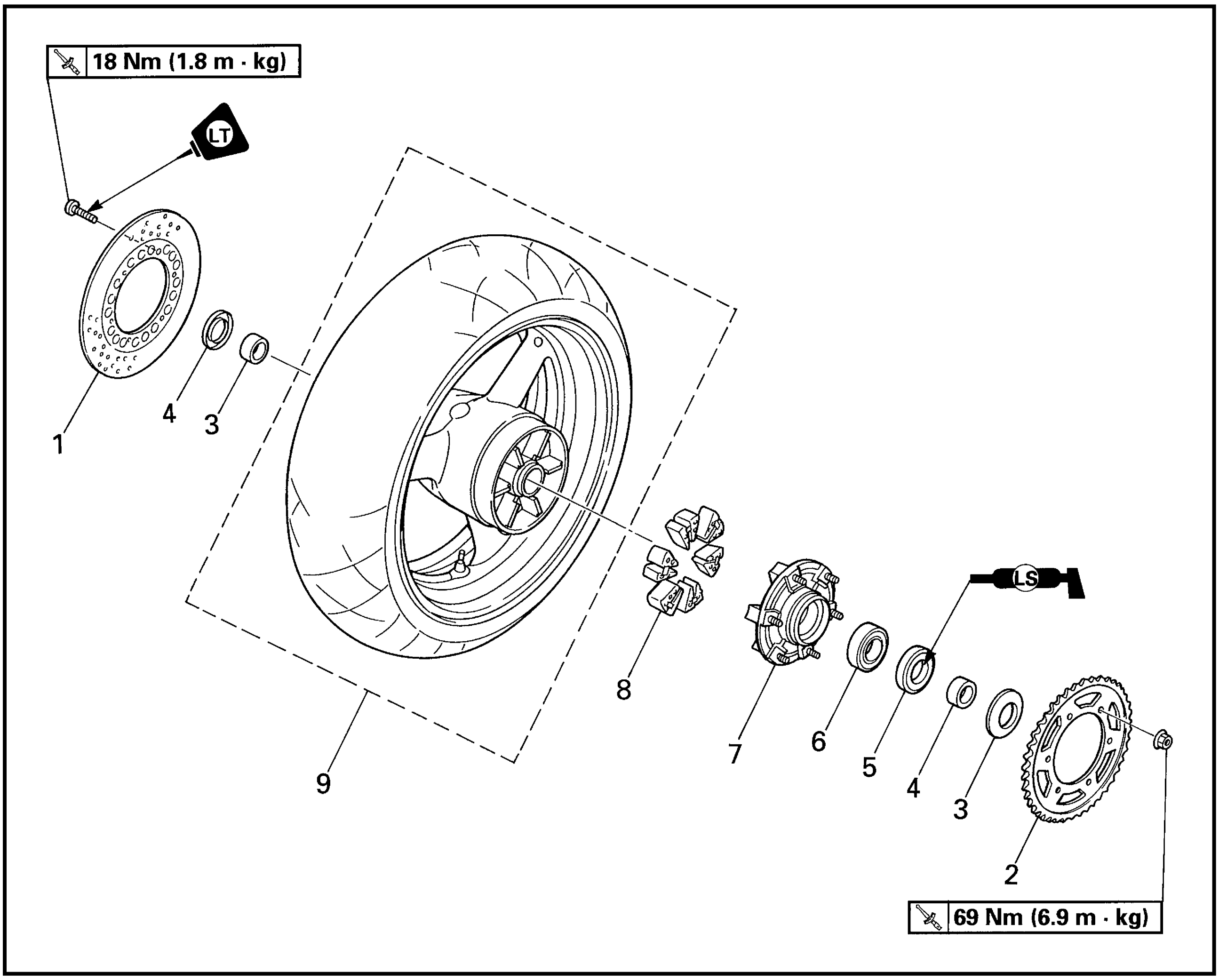
EB701000

REAR WHEEL, BRAKE DISC, AND REAR WHEEL SPROCKET

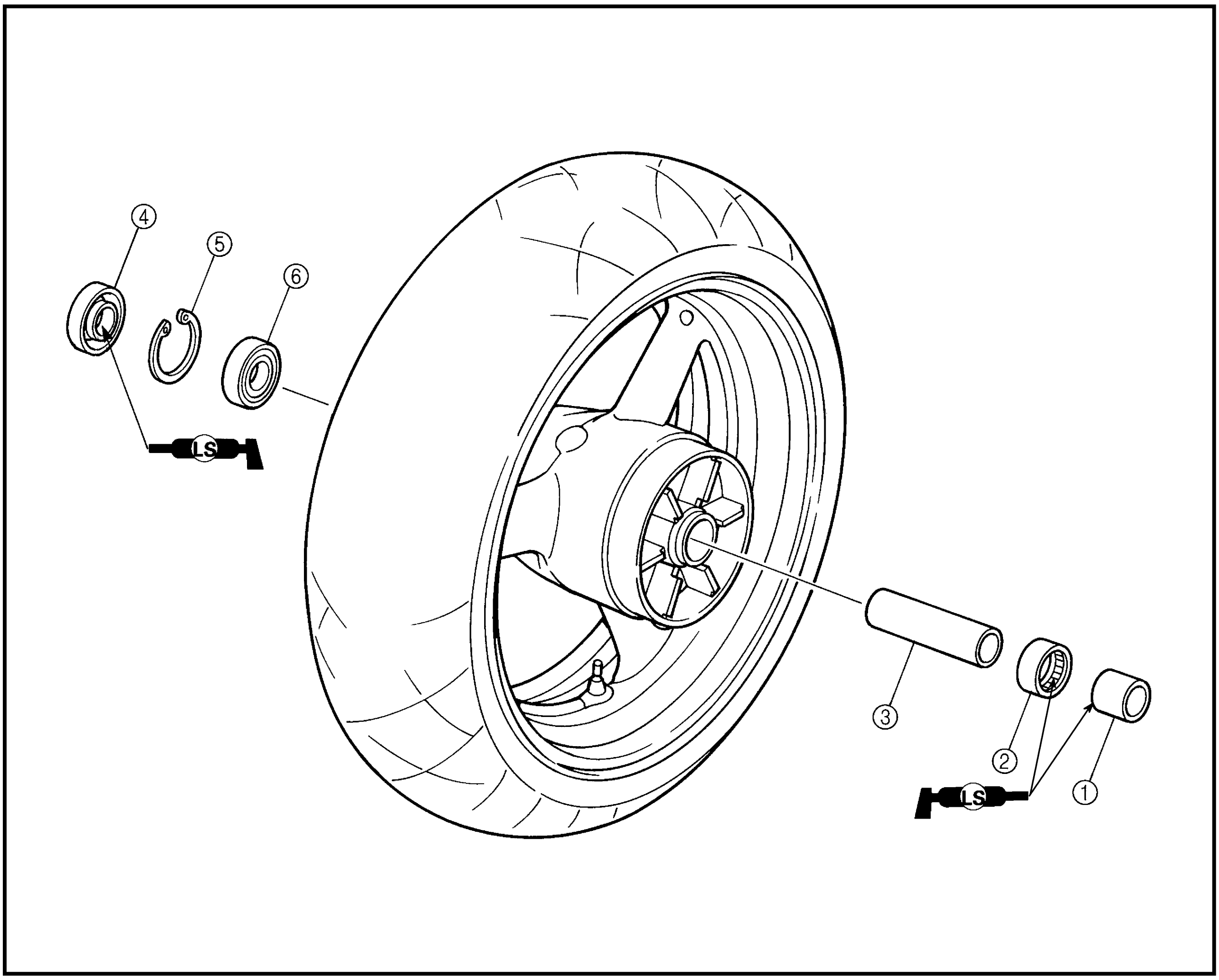


Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Brake caliper	1	
2	Locknut (left and right)	2	Loosen.
3	Adjusting bolt (left and right)	2	Loosen.
4	Wheel axle nut	2	
5	Washer	1	
6	Rear wheel axle	1	
7	Left adjusting block	1	
8	Right adjusting block	1	**NOTE:** Make sure that the tapered side of the right adjusting block faces the wheel.
9	Rear wheel	1	
10	Brake caliper bracket	1	
			For installation, reverse the removal procedure.

EB701010



Order	Job/Part	Q'ty	Remarks
	Removing the brake disc and rear wheel sprocket		Remove the parts in the order listed.
1	Brake disc	1	
2	Rear wheel sprocket	1	
3	Oil seal cover (left and right)	2	
4	Spacer (left and right)	2	
5	Oil seal	1	
6	Bearing	1	
7	Rear wheel drive hub	1	
8	Rear wheel drive hub damper	6	
9	Rear wheel	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear wheel		Remove the parts in the order listed.
①	Spacer	1	
②	Bearing	1	
③	Spacer	1	
④	Oil seal	1	
⑤	Circlip	1	
⑥	Bearing	1	
			For assembly, reverse the disassembly procedure.

EB701100

REMOVING THE REAR WHEEL

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

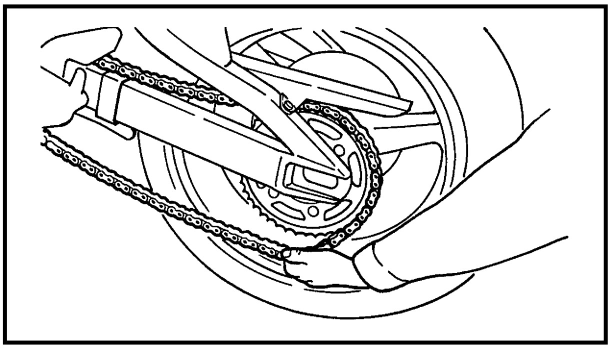
NOTE:

Place the motorcycle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - brake caliper

NOTE:

Do not depress the brake pedal when removing the brake caliper.



3. Remove:
   - wheel axle nut
   - washer
   - wheel axle
   - adjusting blocks
   - rear wheel

NOTE:

Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.

EB701400

CHECKING THE REAR WHEEL

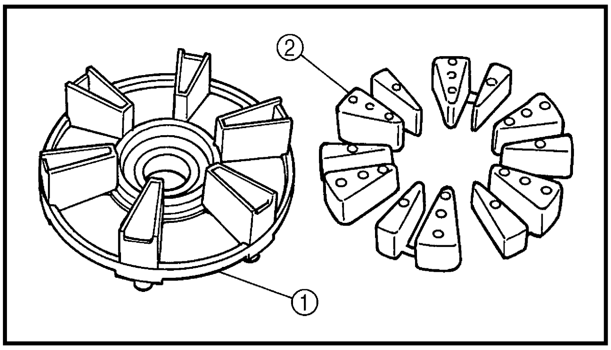
1. Check:
   - wheel axle
   - rear wheel
   - wheel bearings
   - oil seals
   - brake disc
     Refer to “FRONT WHEEL”.
2. Check:
   - tire
   - rear wheel
     Damage/wear → Replace.
     Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.

3. Measure:
   - radial wheel runout
   - lateral wheel runout

   Refer to "FRONT WHEEL".
   Over the specified limits → Replace.

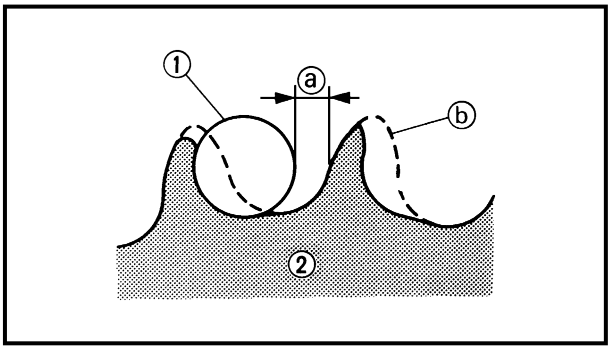
Max. radial wheel runout
1.0 mm
Max. lateral wheel runout
0.5 mm

EB701430
CHECKING THE REAR WHEEL DRIVE HUB



1. Check:
   - rear wheel drive hub ①
     Cracks/damage → Replace.
   - rear wheel drive hub dampers ②
     Damage/wear → Replace.

EB701440
CHECKING AND REPLACING THE REAR WHEEL SPROCKET



1. Check:
   - rear wheel sprocket
     More than 1/4 tooth ⓐ wear → Replace the rear wheel sprocket.
     Bent teeth → Replace the rear wheel sprocket.

     ⓑ Correct
     ① Drive chain roller
     ② Rear wheel sprocket
2. Replace:
   - rear wheel sprocket

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a. Remove the self-locking nuts and the rear wheel sprocket.

b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.

c. Install the new rear wheel sprocket.

Rear wheel sprocket self-locking nut
150 Nm (15.0 m • kg)

NOTE:
Tighten the self-locking nuts in stages and in a crisscross pattern.

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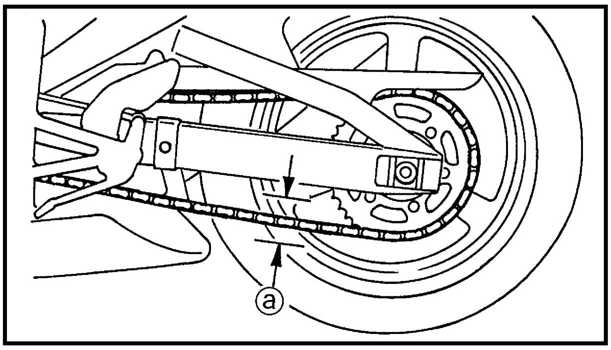
EB701710
INSTALLING THE REAR WHEEL

1. Lubricate:
   - wheel axle
   - wheel bearings
   - oil seal lips

	Recommended lubricant **Lithium soap base grease**



2. Adjust:
   - drive chain slack ⓐ

	Drive chain slack **40 ~ 50 mm**

   Refer to “ADJUSTING THE DRIVE CHAIN SLACK” in chapter 3.

3. Tighten:
   - wheel axle nut **150 Nm (15.0 m · kg)**
   - brake caliper bolts **40 Nm (4.0 m · kg)**

⚠ WARNING

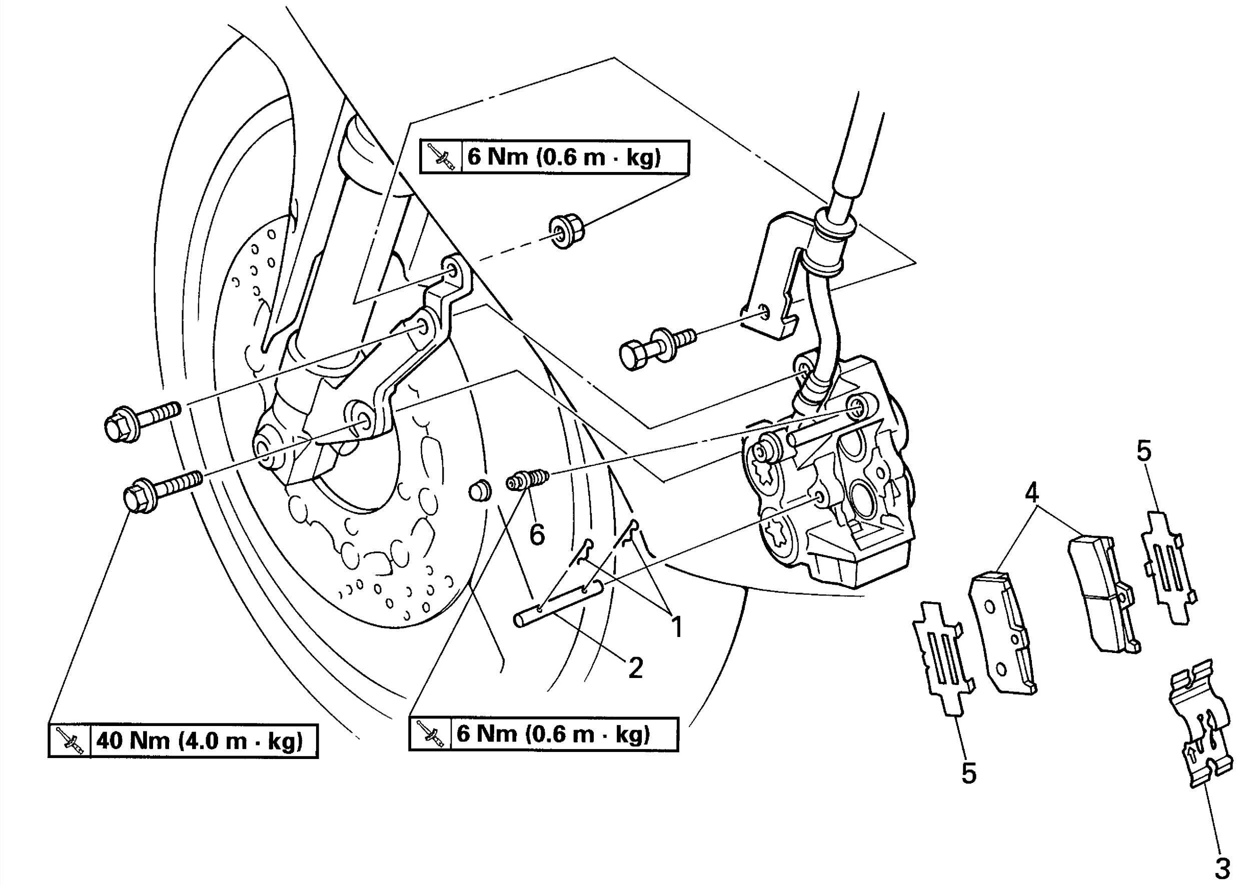
Make sure that the brake hose is routed properly.

EB701900
ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:
- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.

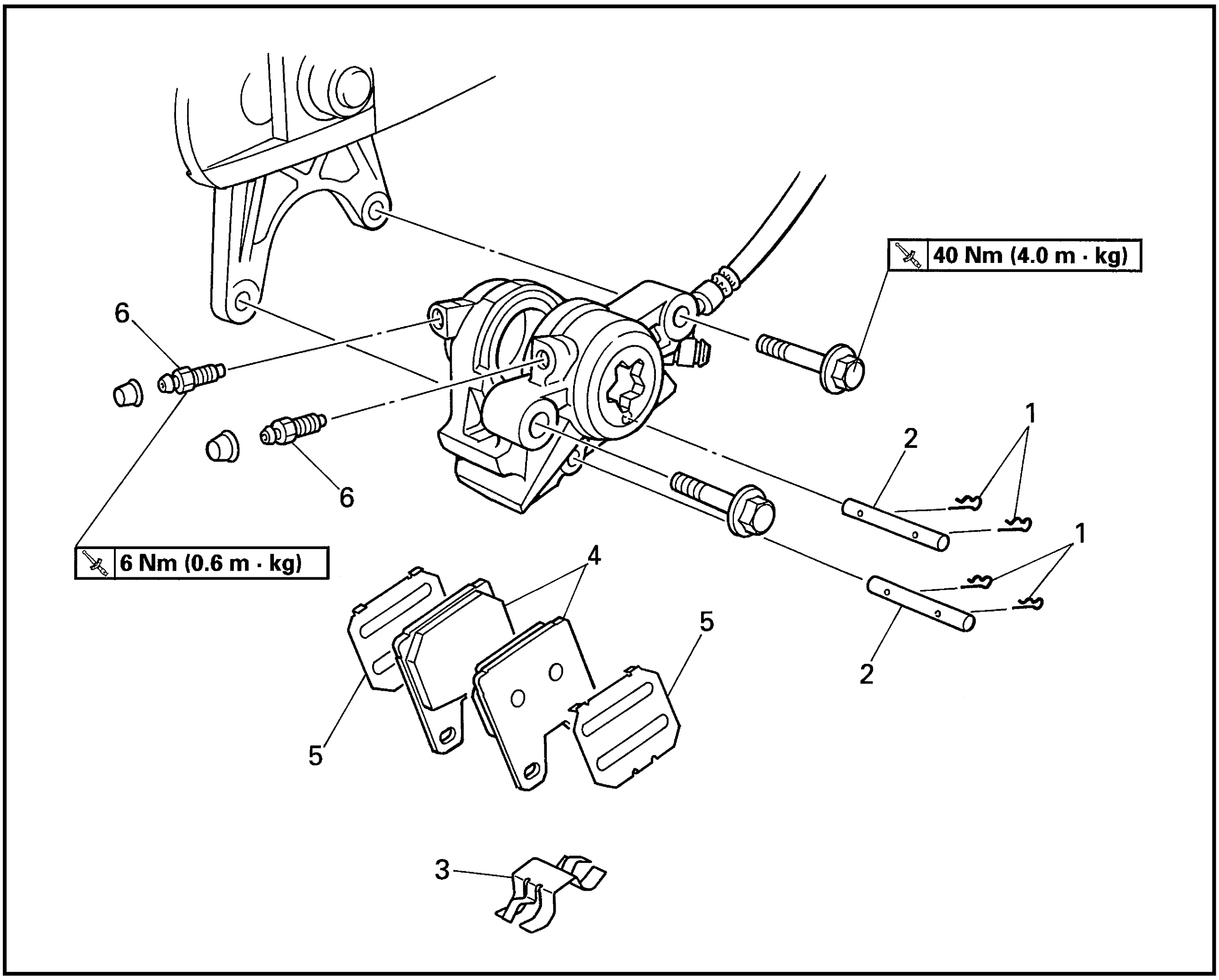
1. Adjust:
   - rear wheel static balance
     Refer to “FRONT WHEEL”.

EB702001
FRONT AND REAR BRAKES



Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers.
1	Brake pad clip	2	
2	Brake pad pin	1	
3	Brake pad spring	1	
4	Brake pad	2	
5	Brake pad shim	2	
6	Bleed screw	1	
			For installation, reverse the removal procedure.

EB702002


40 Nm (4.0 m · kg)
6
6
6 Nm (0.6 m · kg)
1
2
1
2
4
5
5
3

Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads		Remove the parts in the order listed.
1	Brake pad clip	4	
2	Brake pad pin	2	
3	Brake pad spring	1	
4	Brake pad	2	
5	Brake pad shim	2	
6	Bleed screw	2	
			For installation, reverse the removal procedure.

EB702100

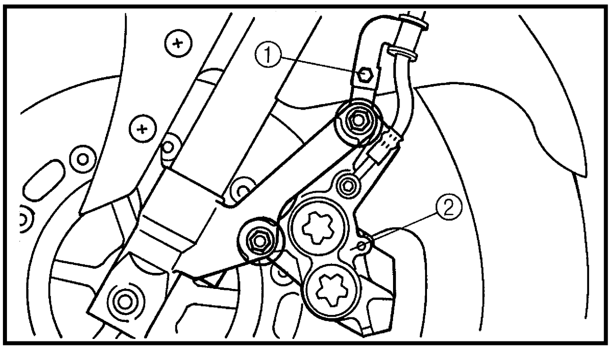
CAUTION:

Disc brake components rarely require disassembly.
Therefore, always follow these preventive measures:

- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.**
- **Never use solvents on internal brake components.**
- **Use only clean or new brake fluid for cleaning brake components.**
- **Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.**
- **Avoid brake fluid coming into contact with the eyes as it can cause serious injury.**

First aid for brake fluid entering the eyes:

- **Flush with water for 15 minutes and get immediate medical attention.**



EB702112

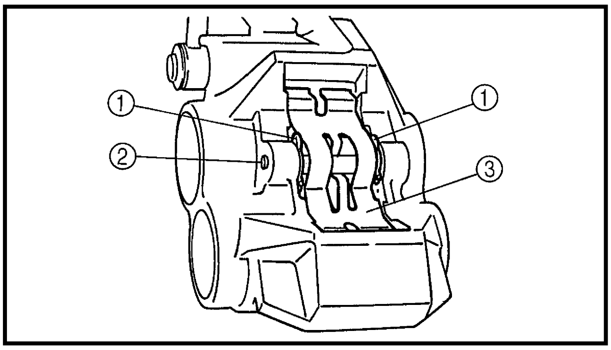
REPLACING THE FRONT BRAKE PADS

The following procedure applies to both brake calipers.

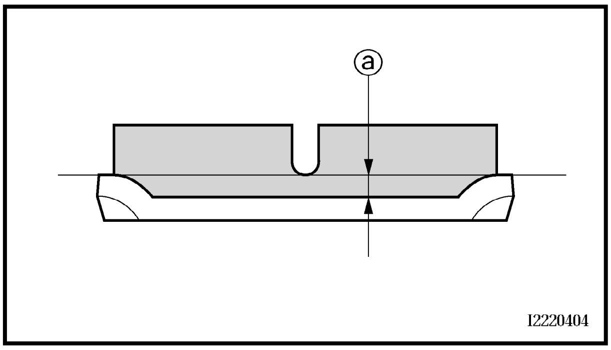
NOTE:

When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Remove:
   - brake hose holder bolt ①
   - brake caliper ②



2. Remove:
   - brake pad clips ①
   - brake pad pin ②
   - brake pad spring ③
   - brake pads
     (along with the brake pad shims)



3. Measure:
   - brake pad wear limit ⓐ
     Out of specification → Replace the brake pads as a set.

Brake pad wear limit
0.5 mm

4. Install:
   - brake pad shims
     (onto the brake pads)
   - brake pads
   - brake pad spring

NOTE:
Always install new brake pads, brake pad shims, and a brake pad spring as a set.

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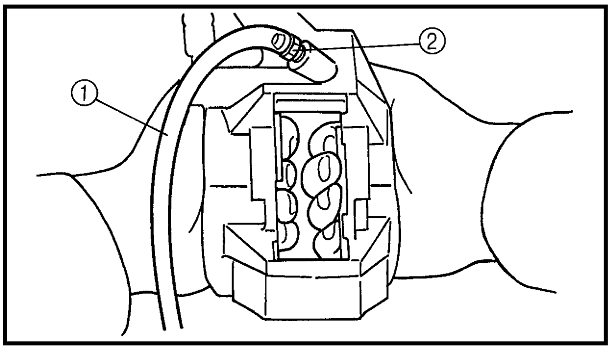


a. Connect a clear plastic hose ① tightly to the bleed screw ②. Put the other end of the hose into an open container.

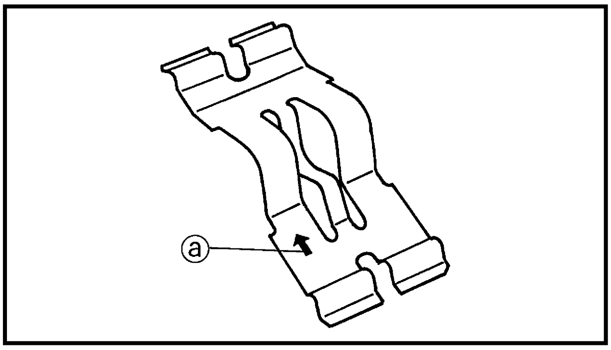
b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.

c. Tighten the bleed screw.

Bleed screw
6 Nm (0.6 m • kg)

d. Install a new brake pad shim onto each new brake pads.

e. Install new brake pads and a new brake pad spring.



NOTE:
The arrow ⓐ on the brake pad spring must point in the direction of disc rotation.

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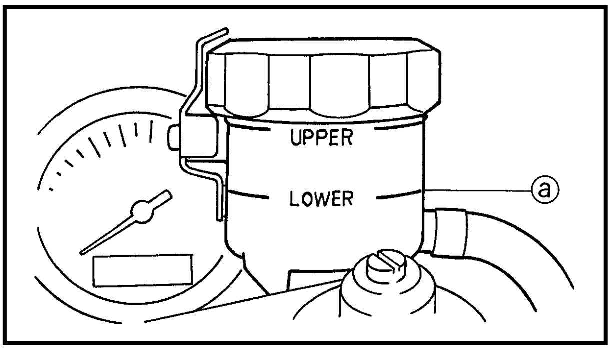
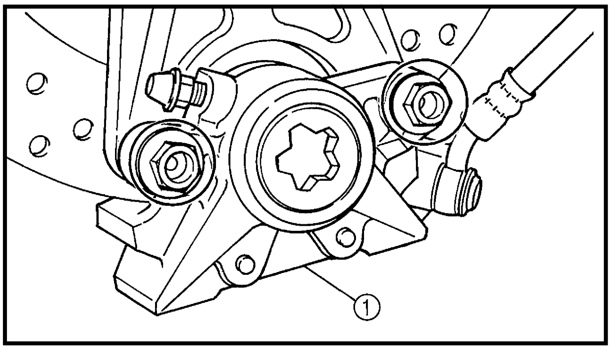
5. Install:
   - brake pad pin
   - brake pad clips
   - brake caliper

40 Nm (4.0 m · kg)



6. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

7. Check:
   - brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

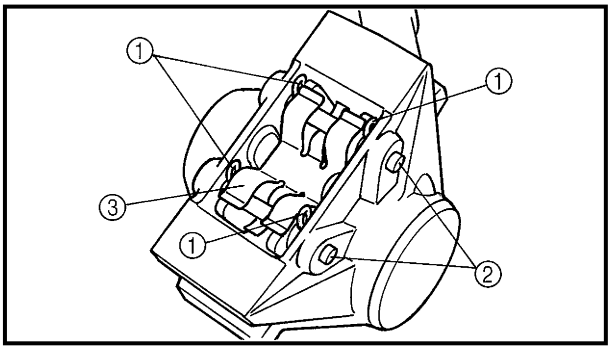


EB702113

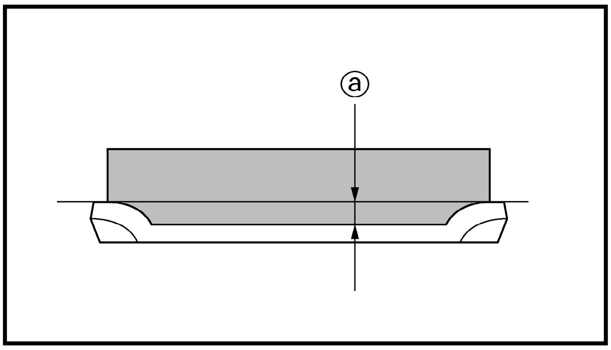
REPLACING THE REAR BRAKE PADS

NOTE:
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

1. Remove:
   - brake caliper ①
   - brake pad cover



2. Remove:
   - brake pad clips ①
   - brake pad pins ②
   - brake pad spring ③
   - brake pads
     (along with the brake pad shims)



3. Measure:
   - brake pad wear limit ⓐ
     Out of specification → Replace the brake pads as a set.

Brake pad wear limit
0.5 mm

4. Install:
   - brake pad shims
     (onto the brake pads)
   - brake pads
   - brake pad spring

NOTE:
Always install new brake pads, brake pad shims, and a brake pad spring as a set.

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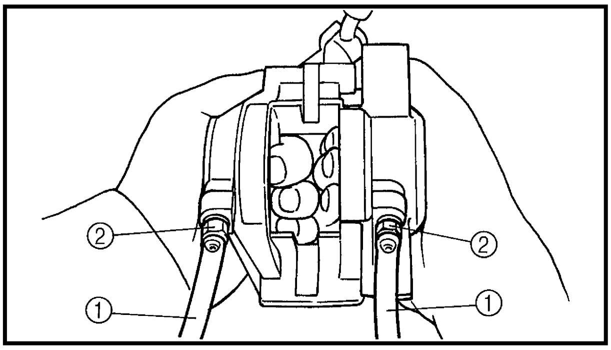

a. Connect a clear plastic hose ① tightly to the bleed screw ②. Put the other end of the hose into an open container.

b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.

c. Tighten the bleed screw.

Bleed screw
6 Nm (0.6 m • kg)

d. Install a new brake pad shim onto each new brake pad.

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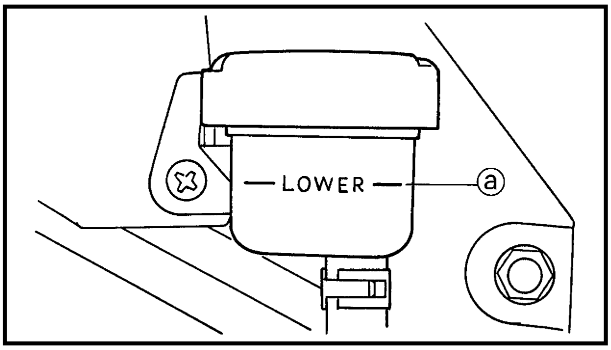
5. Install:
   - brake pad pins
   - brake pad clips
   - brake pad cover
   - brake caliper

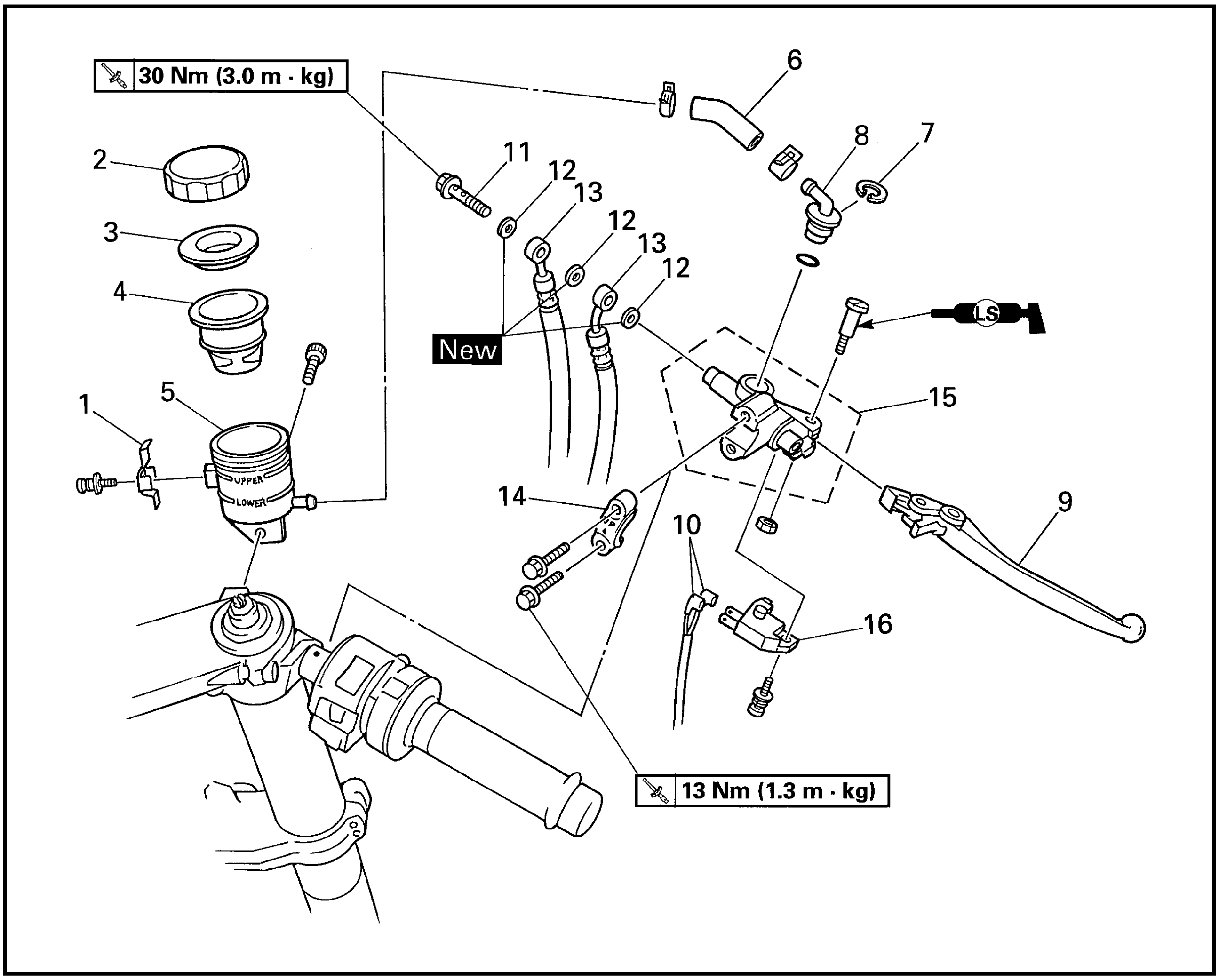
40 Nm (4.0 m · kg)



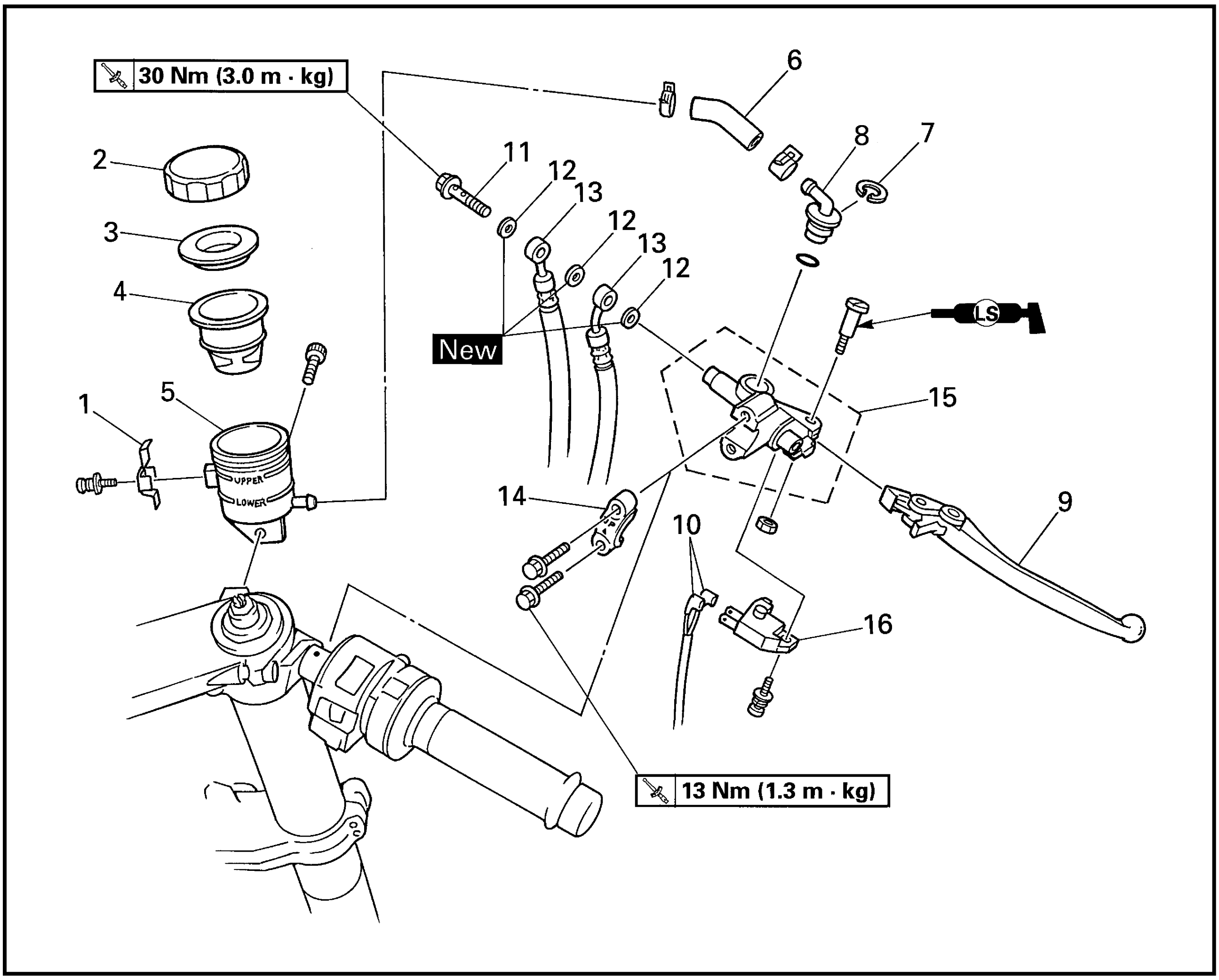
6. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

7. Check:
   - brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

EB702200

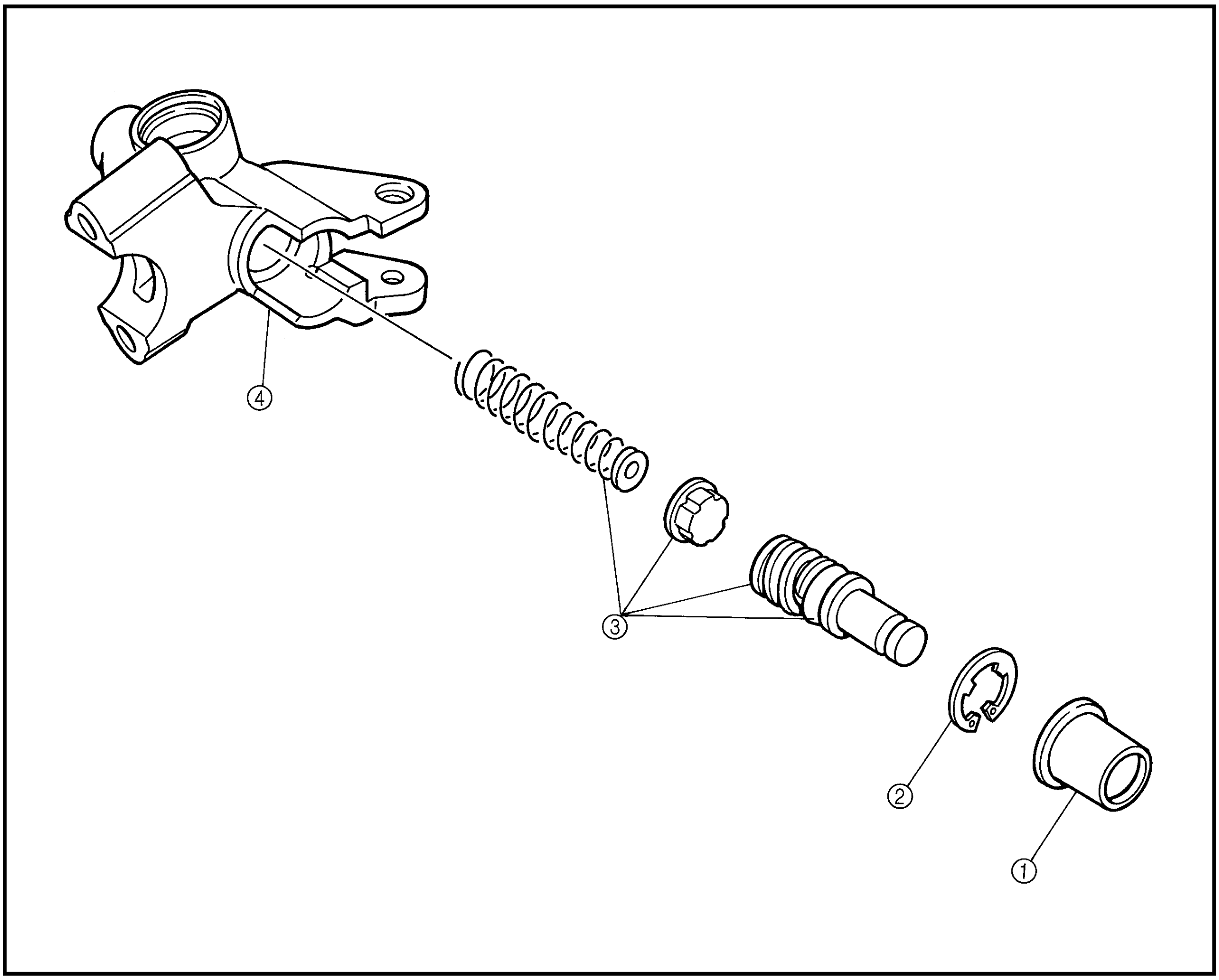

30 Nm (3.0 m · kg)
6
8
7
2
11
12
13
12
13
12
3
4
New
LS
1
5
UPPER
LOWER
15
14
9
10
16
13 Nm (1.3 m · kg)

Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder and brake fluid reservoir		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake fluid reservoir cap stopper	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Circlip	1	
8	Hose joint	1	
9	Brake lever	1	
10	Front brake switch connector	2	Disconnect.
11	Union bolt	1	
12	Copper washer	3	

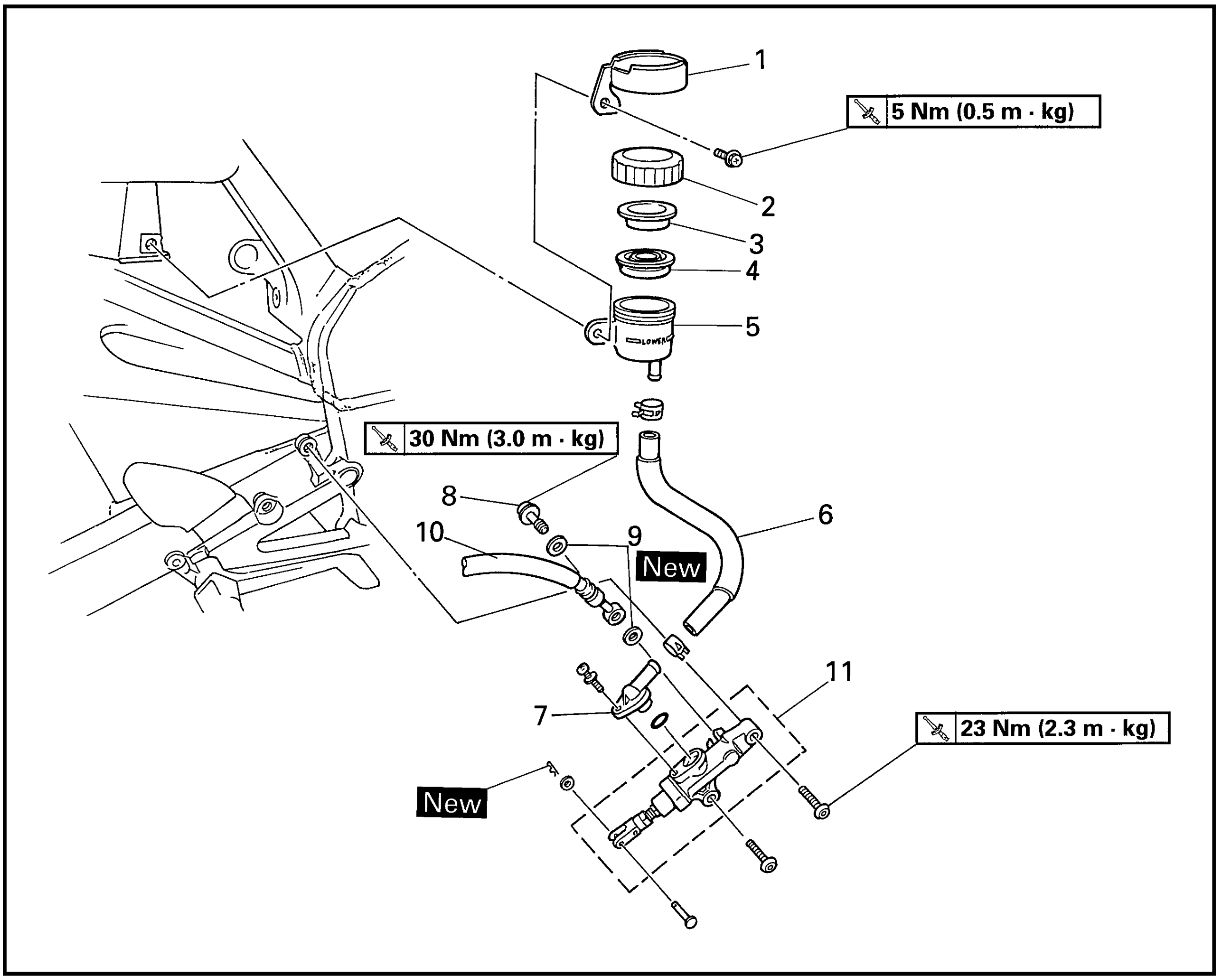

30 Nm (3.0 m · kg)
6
11
12
13
12
13
12
8
7
2
3
4
New
LS
1
5
UPPER
LOWER
15
14
10
9
16
13 Nm (1.3 m · kg)

Order	Job/Part	Q'ty	Remarks
13	Brake hose	2	
14	Brake master cylinder holder	1	
15	Brake master cylinder	1	
16	Front brake switch	1	
			For installation, reverse the removal procedure.

EB702201

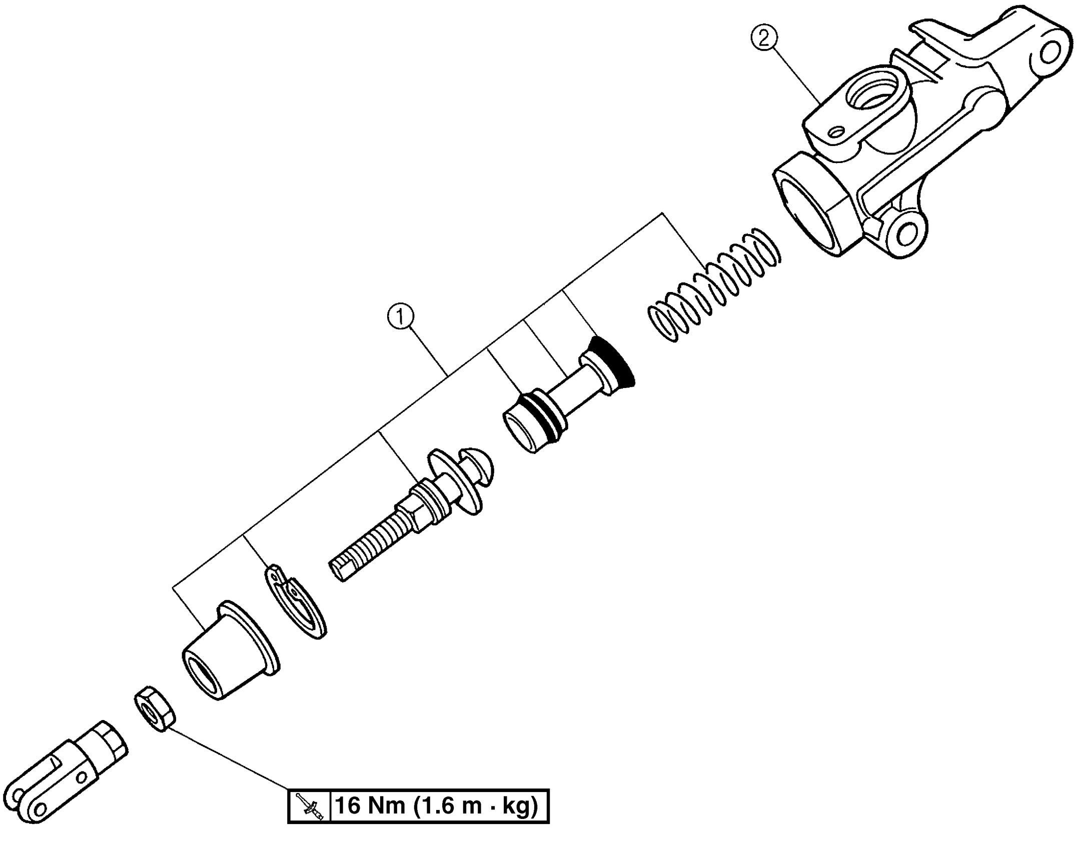


Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Brake master cylinder kit	1	
④	Brake master cylinder	1	
			For assembly, reverse the disassembly procedure.

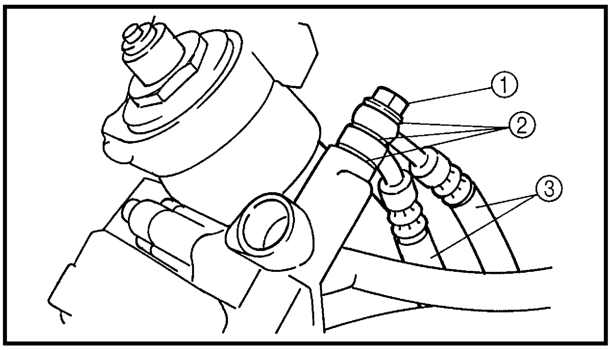


Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder and brake fluid reservoir		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake fluid reservoir cap stopper	1	
2	Brake fluid reservoir cap	1	
3	Brake fluid reservoir diaphragm holder	1	
4	Brake fluid reservoir diaphragm	1	
5	Brake fluid reservoir	1	
6	Brake fluid reservoir hose	1	
7	Hose joint	1	
8	Union bolt	1	
9	Copper washer	2	
10	Brake hose	1	
11	Brake master cylinder	1	
			For installation, reverse the removal procedure.

EB702203



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake master cylinder		Remove the parts in the order listed.
①	Brake master cylinder kit	1	
②	Brake master cylinder	1	
			For assembly, reverse the disassembly procedure.



EB702210

DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

NOTE:

Before disassembling the front brake master cylinder, drain the brake fluid from the entire brake system.

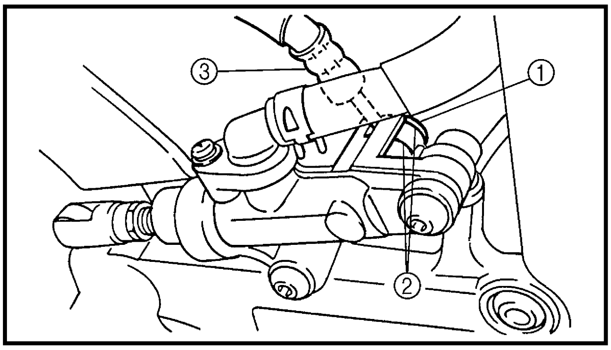
1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hoses ③

NOTE:

To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

EB702220

DISASSEMBLING THE REAR BRAKE MASTER CYLINDER



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

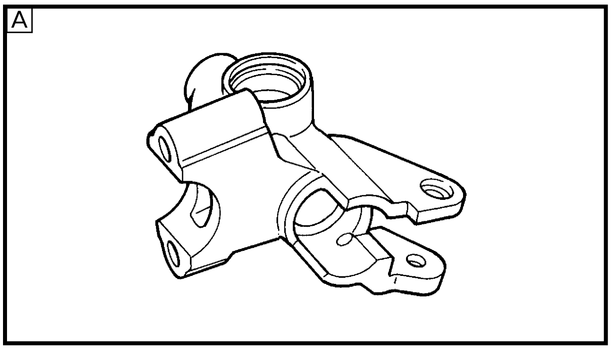
NOTE:

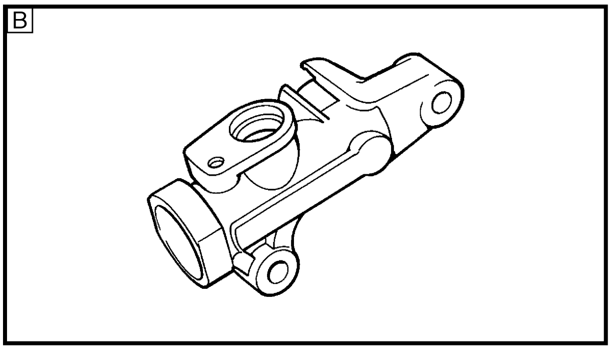
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

EB702243

CHECKING THE FRONT AND REAR BRAKE MASTER CYLINDERS

The following procedure applies to both of the brake master cylinders.

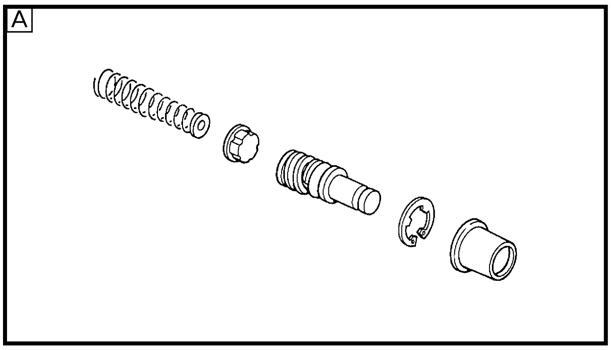


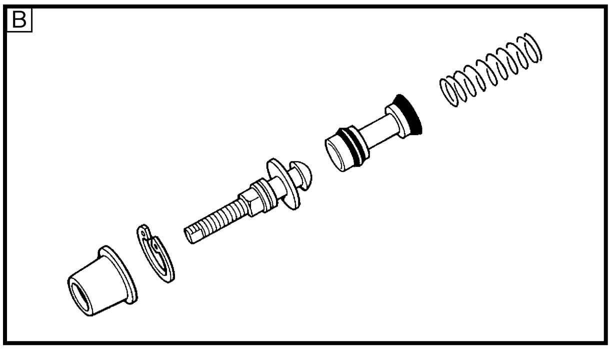


1. Check:
   - brake master cylinder
     Damage/scratches/wear → Replace.
   - brake fluid delivery passages
     (brake master cylinder body)
     Obstruction → Blow out with compressed air.

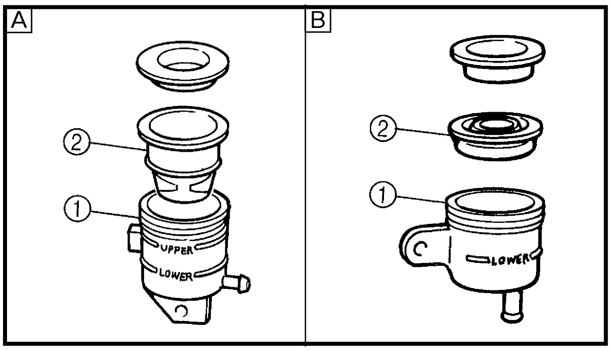
   A Front

   B Rear





2. Check:
   - brake master cylinder kit
     Damage/scratches/wear → Replace.
     A Front
     B Rear



3. Check:
   - brake fluid reservoir ①
     Cracks/damage → Replace.
   - brake fluid reservoir diaphragm ②
     Cracks/damage → Replace.
4. Check:
   - brake hoses
     Cracks/damage/wear → Replace.

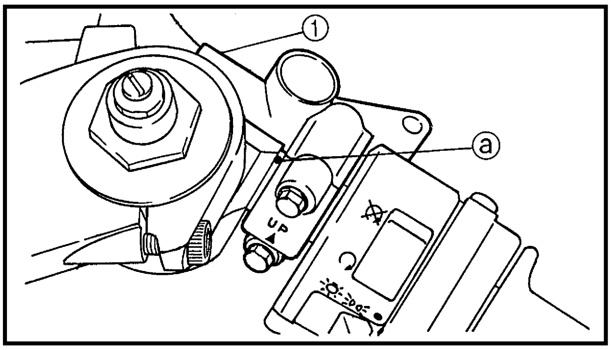
EB702283

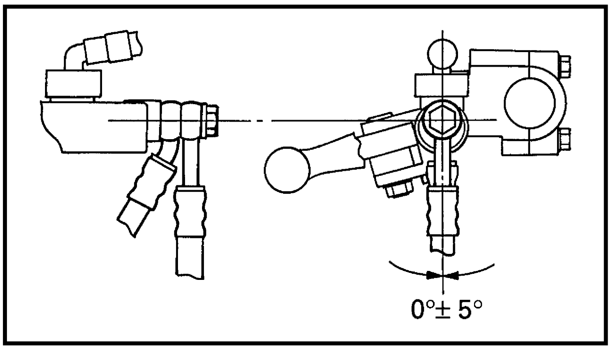
ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components.**

Recommended brake fluid
DOT 4





1. Install:
   - brake master cylinder ①

   13 Nm (1.3 m · kg)

NOTE:

- Install the brake master cylinder holder with the “UP” mark facing up.
- Align the end of the brake master cylinder holder with the punch mark ⓐ in the right handlebar.
- First, tighten the upper bolt, then the lower bolt.

2. Install:
   - copper washers New
   - brake hose
   - union bolt **30 Nm (3.0 m · kg)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to “CABLE ROUTING”.

NOTE:

- While holding the brake hose, tighten the union bolt as shown.
- Turn the handlebars to the left and to the right to make sure that the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.

3. Fill:
   - brake fluid reservoir
     (with the specified amount of the recommended brake fluid)

Recommended brake fluid
DOT 4

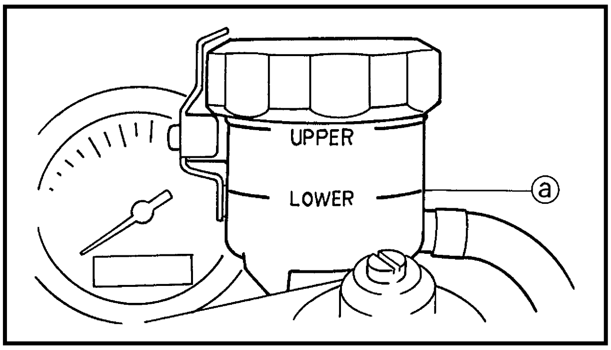
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

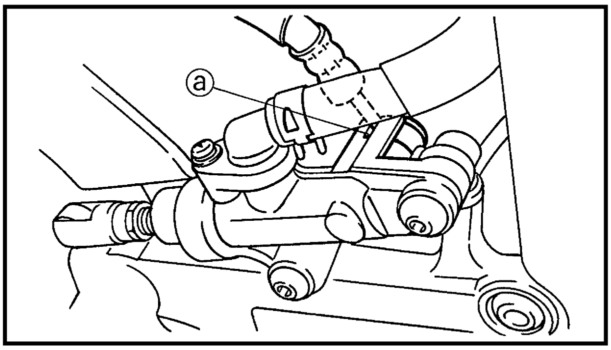
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

4. Bleed:
   - brake system
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



5. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

6. Check:
   - brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



EB702290

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

1. Install:
   - copper washers **New**
   - brake hoses
   - union bolt **30 Nm (3.0 m · kg)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to “CABLE ROUTING”.

CAUTION:

When installing the brake hose onto the brake master cylinder, make sure that the brake pipe touches the projection ⓐ as shown.

2. Fill:
   - brake fluid reservoir

Recommended brake fluid
DOT 4

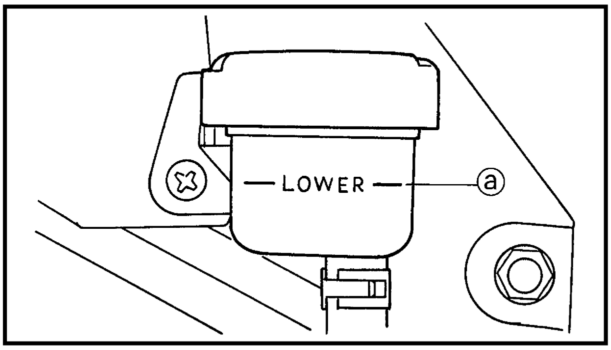
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

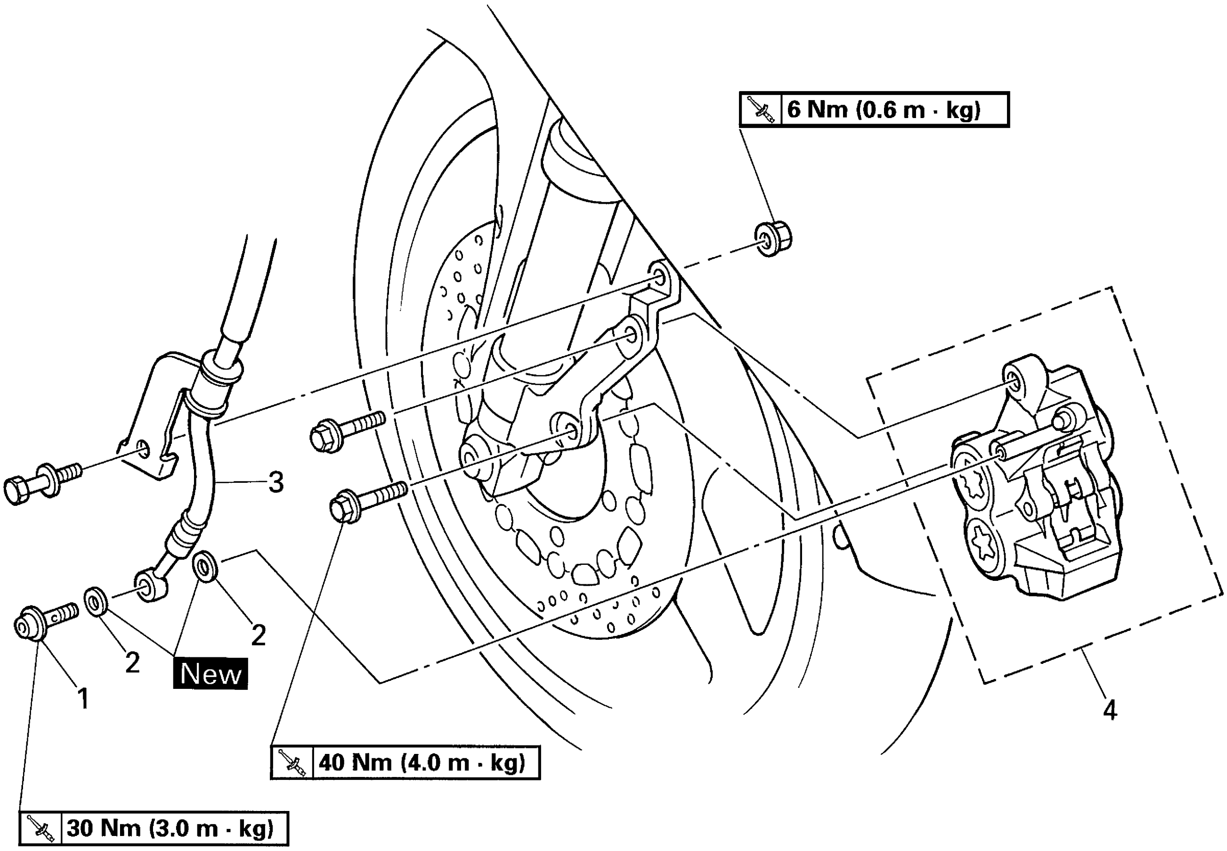
3. Bleed:
   - brake system
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



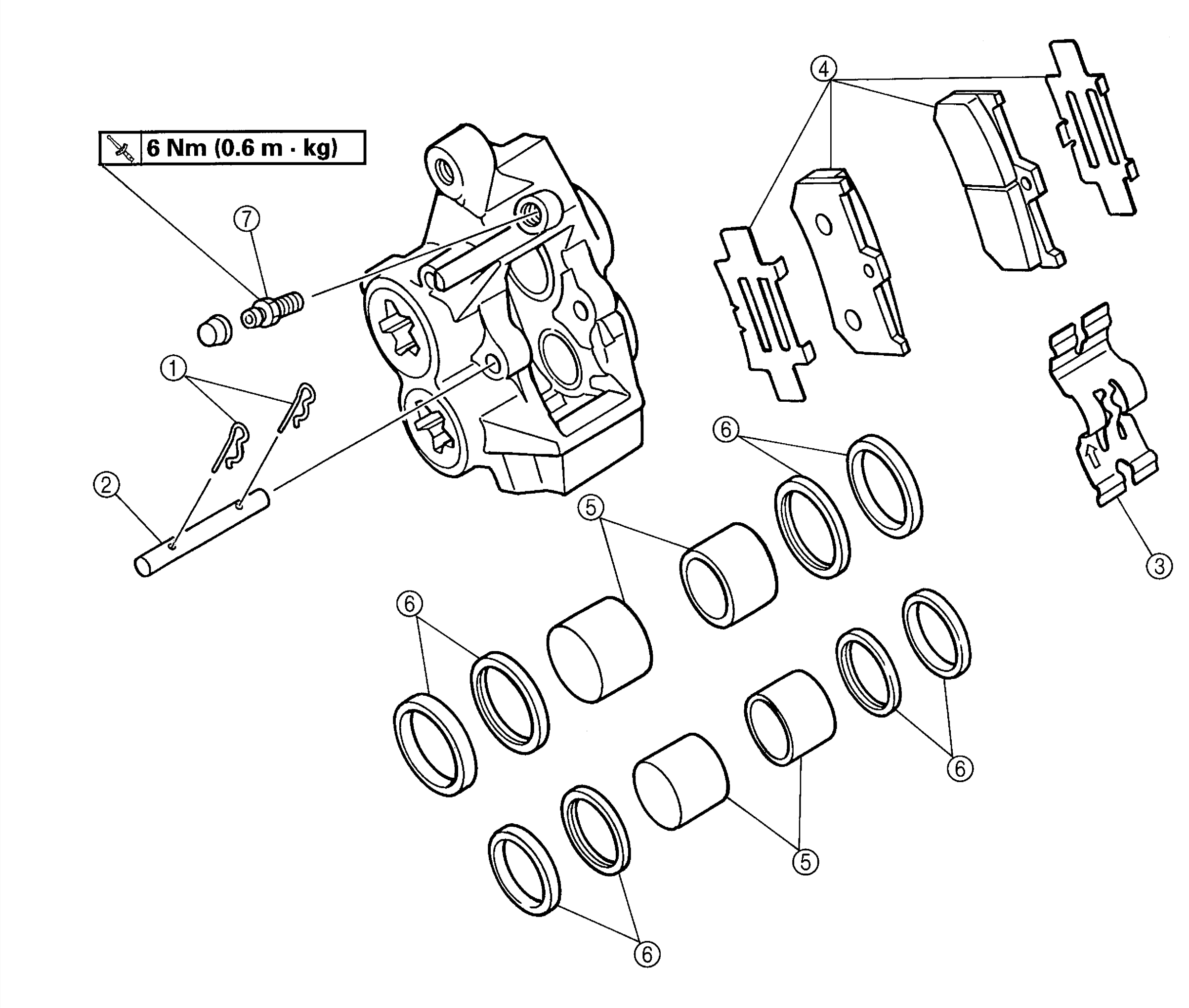
4. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
5. Adjust:
   - brake pedal position
     Refer to “ADJUSTING THE REAR BRAKE” in chapter 3.

Brake pedal position (from the top of the brake pedal to the bottom of the rider footrest bracket)
35 ~ 40 mm

6. Adjust:
   - rear brake light operation timing
     Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” in chapter 3.

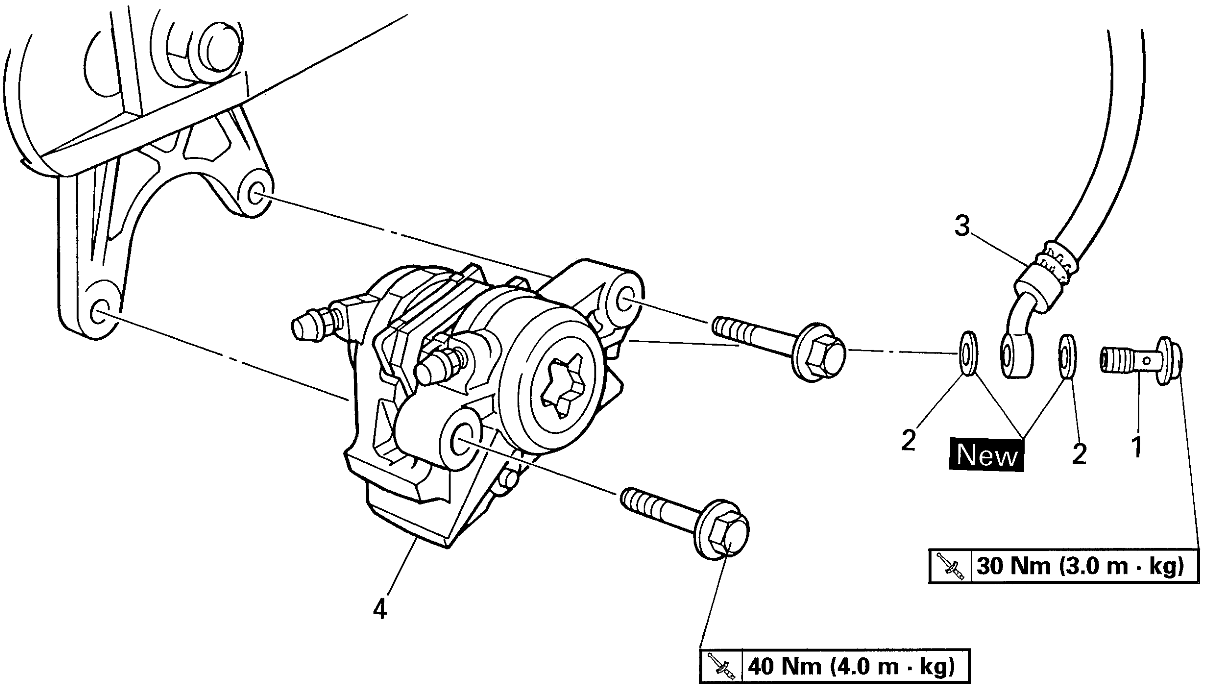

6 Nm (0.6 m · kg)
3
2
2
New
1
4
40 Nm (4.0 m · kg)
30 Nm (3.0 m · kg)

Order	Job/Part	Q'ty	Remarks
	Removing the front brake calipers		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers.
	Brake fluid		Drain.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper	1	
			For installation, reverse the removal procedure.



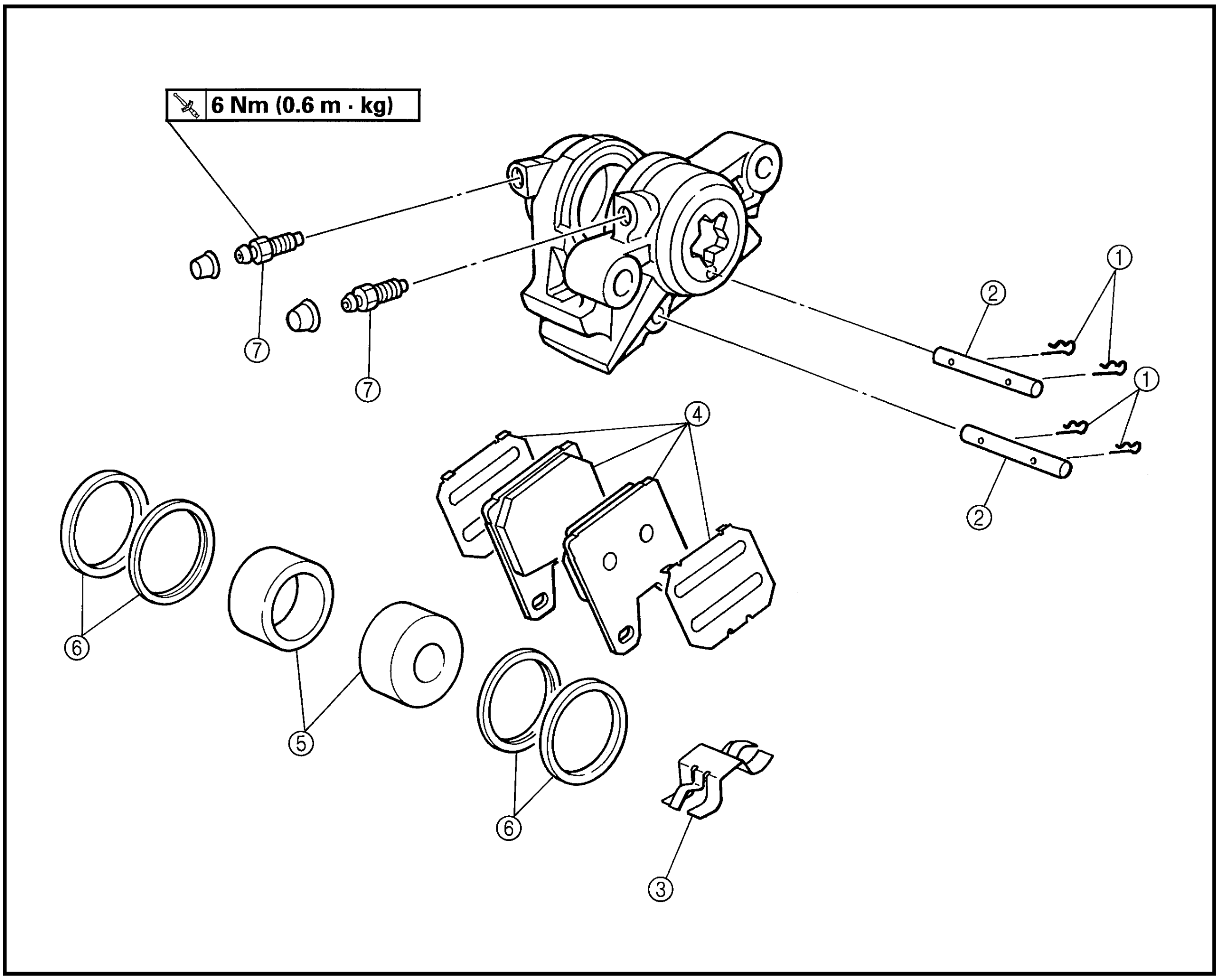
Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Remove the parts in the order listed. The following procedure applies to both of the front brake calipers.
①	Brake pad clip	2	
②	Brake pad pin	1	
③	Brake pad spring	1	
④	Brake pad	2	
⑤	Brake caliper piston	4	
⑥	Brake caliper piston seal	8	
⑦	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

EB702304


3
2
New
2
1
4
30 Nm (3.0 m · kg)
40 Nm (4.0 m · kg)

Order	Job/Part	Q'ty	Remarks
	Removing the rear brake caliper		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper	1	
			For installation, reverse the removal procedure.

EB702305



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Remove the parts in the order listed.
①	Brake pad clip	4	
②	Brake pad pin	2	
③	Brake pad spring	1	
④	Brake pad	2	
⑤	Brake caliper piston	2	
⑥	Brake caliper piston seal	4	
⑦	Bleed screw	2	
			For assembly, reverse the disassembly procedure.

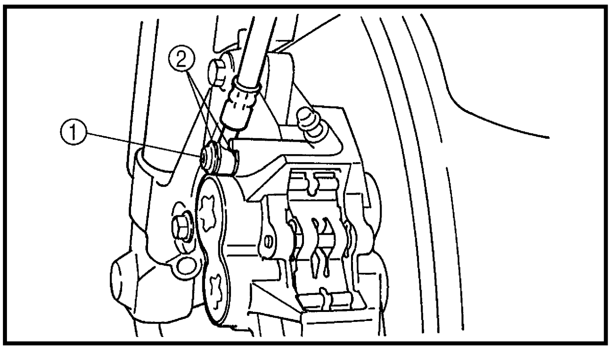
EB702317

DISASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

NOTE:

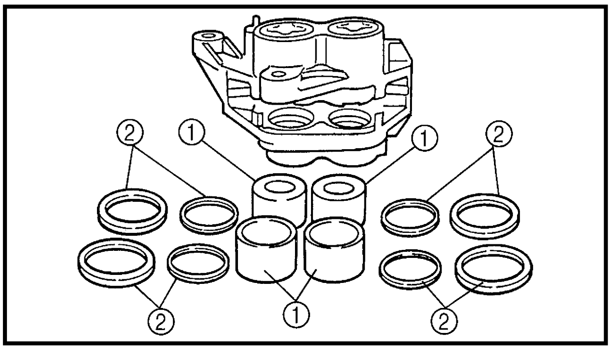
Before disassembling either brake caliper, drain the brake fluid from the entire brake system.



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose

NOTE:

Put the end of the brake hose into a container and pump out the brake fluid carefully.

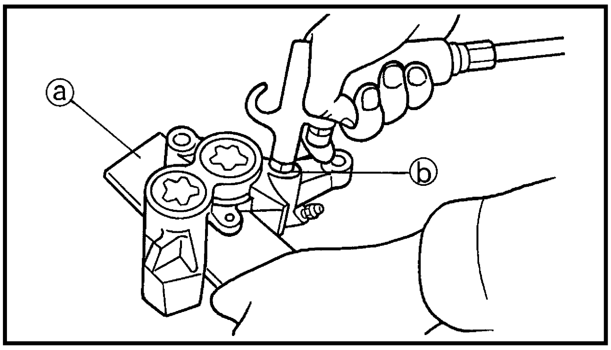


2. Remove:
   - brake caliper pistons ①
   - brake caliper piston seals ②

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

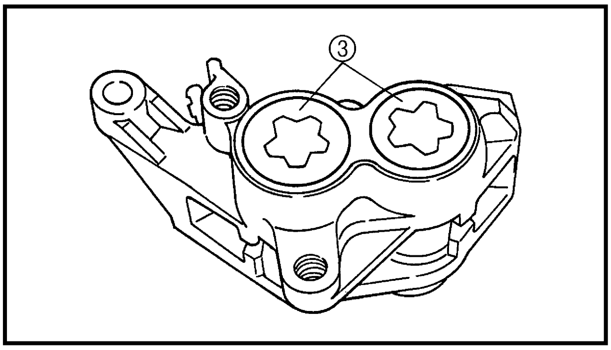
a. Secure the right side brake caliper pistons with a piece of wood ⓐ.

b. Blow compressed air into the brake hose joint opening ⓑ to force out the left side pistons from the brake caliper.



⚠ WARNING

- **Never try to pry out the brake caliper pistons.**
- **Do not loosen the bolts ③.**



c. Remove the brake caliper piston seals.

d. Repeat the previous steps to force out the right side pistons from the brake caliper.

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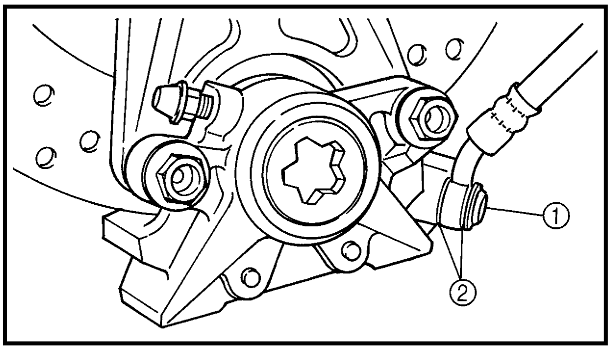
EB702322

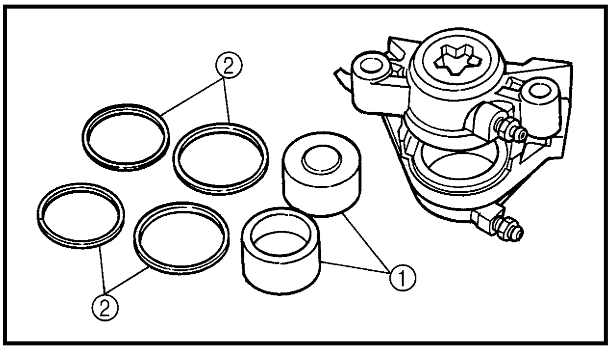
DISASSEMBLING THE REAR BRAKE CALIPER

NOTE:
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose

NOTE:
Put the end of the brake hose into a container and pump out the brake fluid carefully.

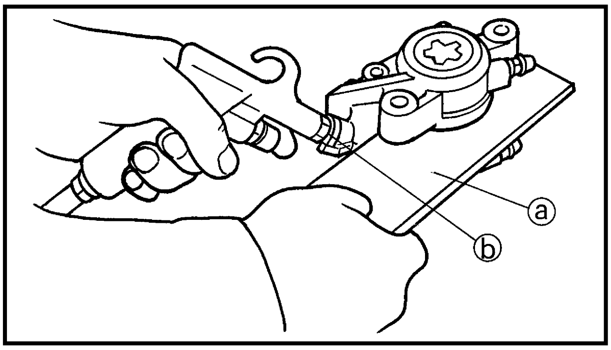


2. Remove:
   - brake caliper pistons ①
   - brake caliper piston seals ②

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

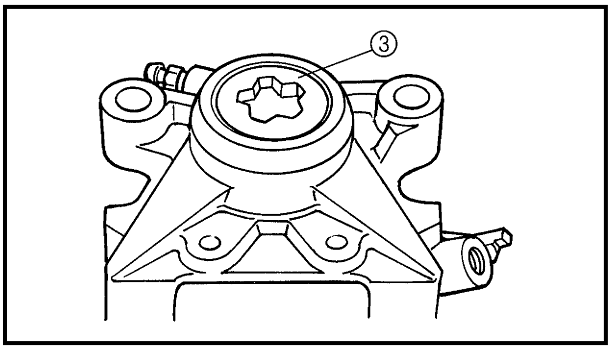
a. Secure the right side brake caliper piston with a piece of wood ⓐ.

b. Blow compressed air into the brake hose joint opening ⓑ to force out the left side piston from the brake caliper.



⚠ WARNING

- **Never try to pry out the brake caliper pistons.**
- **Do not loosen the bolt ③.**



c. Remove the brake caliper piston seals.

d. Repeat the previous steps to force out the right side piston from the brake caliper.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EB702343

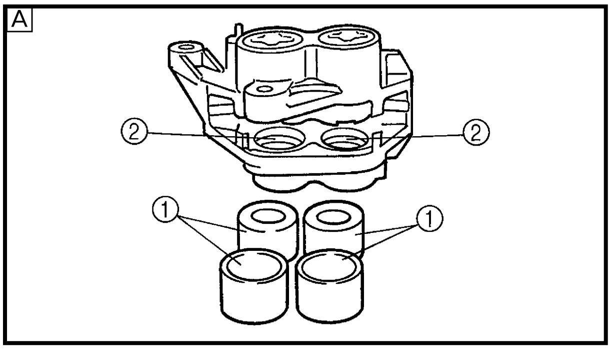
CHECKING THE FRONT AND REAR BRAKE CALIPERS

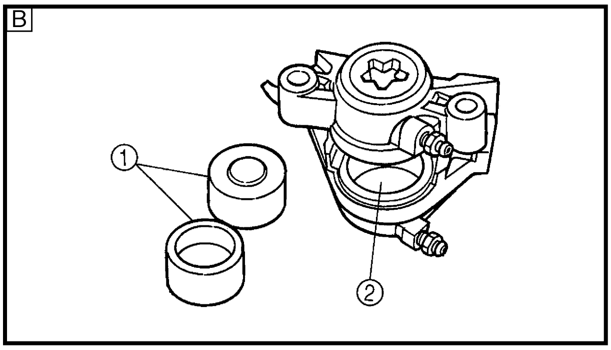
Recommended brake component replacement schedule	
Brake pads	**If necessary**
Piston seals	**Every two years**
Brake hoses	**Every two years**
Brake fluid	**Every two years and whenever the brake is disassembled**

1. Check:
   - brake caliper pistons ①
     Rust/scratches/wear → Replace the brake caliper.
   - brake caliper cylinders ②
     Scratches/wear → Replace the brake caliper.
   - brake calipers
     Cracks/damage → Replace.
   - brake fluid delivery passages (brake caliper body)
     Obstruction → Blow out with compressed air.

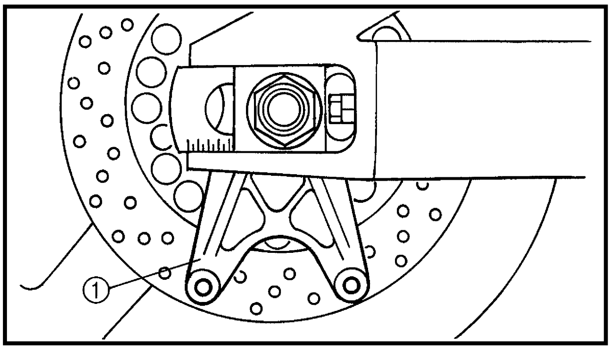
⚠ WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston seals.





A Front
B Rear



2. Check:
   - rear brake caliper bracket ①
     Cracks/damage → Replace.

EB702376

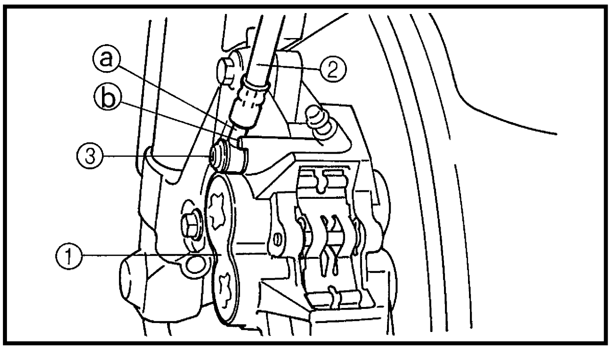
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

Recommended brake fluid
DOT 4



1. Install:
   - brake caliper ① (temporarily)
   - copper washers **New**
   - brake hose ②
   - union bolt ③ **30 Nm (3.0 m · kg)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to “CABLE ROUTING”.

CAUTION:

When installing the brake hose onto the brake caliper ①, make sure that the brake pipe ⓐ touches the projection ⓑ on the brake caliper.

2. Remove:
   - brake caliper

3. Install:
   - brake pads
   - brake pad spring
   - brake caliper **40 Nm (4.0 m · kg)**
   - brake hose holder **7 Nm (0.7 m · kg)**

   Refer to “REPLACING THE FRONT BRAKE PADS”.

4. Fill:
   - brake fluid reservoir
     (with the specified amount of the recommended brake fluid)

Recommended brake fluid
DOT 4

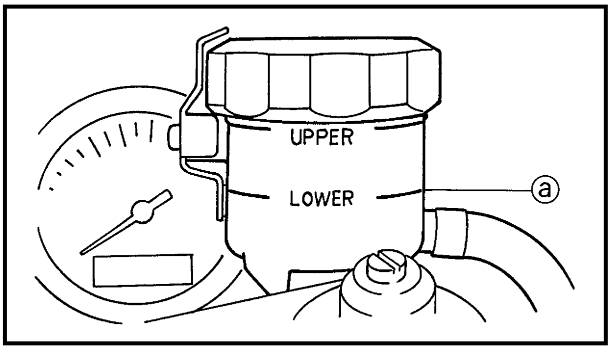
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:
   - brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.



6. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

7. Check:
   - brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

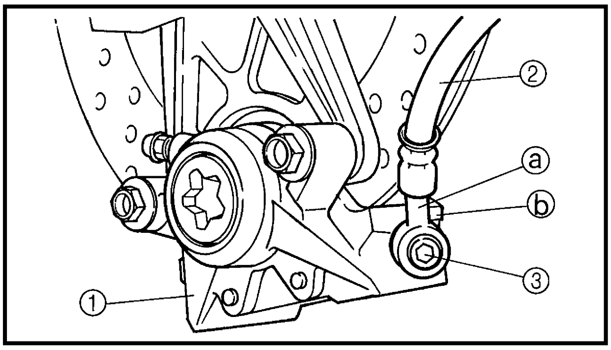
EB702378

ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

⚠ WARNING

- **Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.**
- **Never use solvents on internal brake components as they will cause the piston seals to swell and distort.**
- **Whenever a brake caliper is disassembled, replace the brake caliper piston seals.**

Recommended brake fluid
DOT 4



1. Install:
   - brake caliper ① (temporarily)
   - copper washers **New**
   - brake hose ②
   - union bolt ③ **30 Nm (3.0 m · kg)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to “CABLE ROUTING”.

CAUTION:

When installing the brake hose onto the brake caliper ①, make sure that the brake pipe ⓐ touches the projection ⓑ on the brake caliper.

2. Remove:
   - brake caliper
3. Install:
   - brake pads
   - brake pad springs
   - brake caliper **40 Nm (4.0 m · kg)**
   - brake hose holder **7 Nm (7.0 m · kg)**

   Refer to “REPLACING THE REAR BRAKE PADS”.

4. Fill:
   - brake fluid reservoir
     (with the specified amount of the recommended brake fluid)

	Recommended brake fluid **DOT 4**

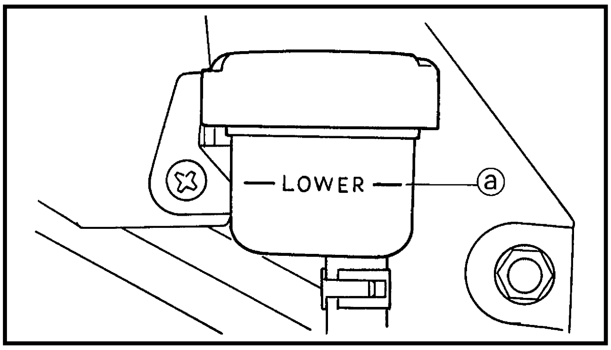
⚠ WARNING

- **Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.**
- **When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.**

CAUTION:

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

5. Bleed:
   - brake system
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

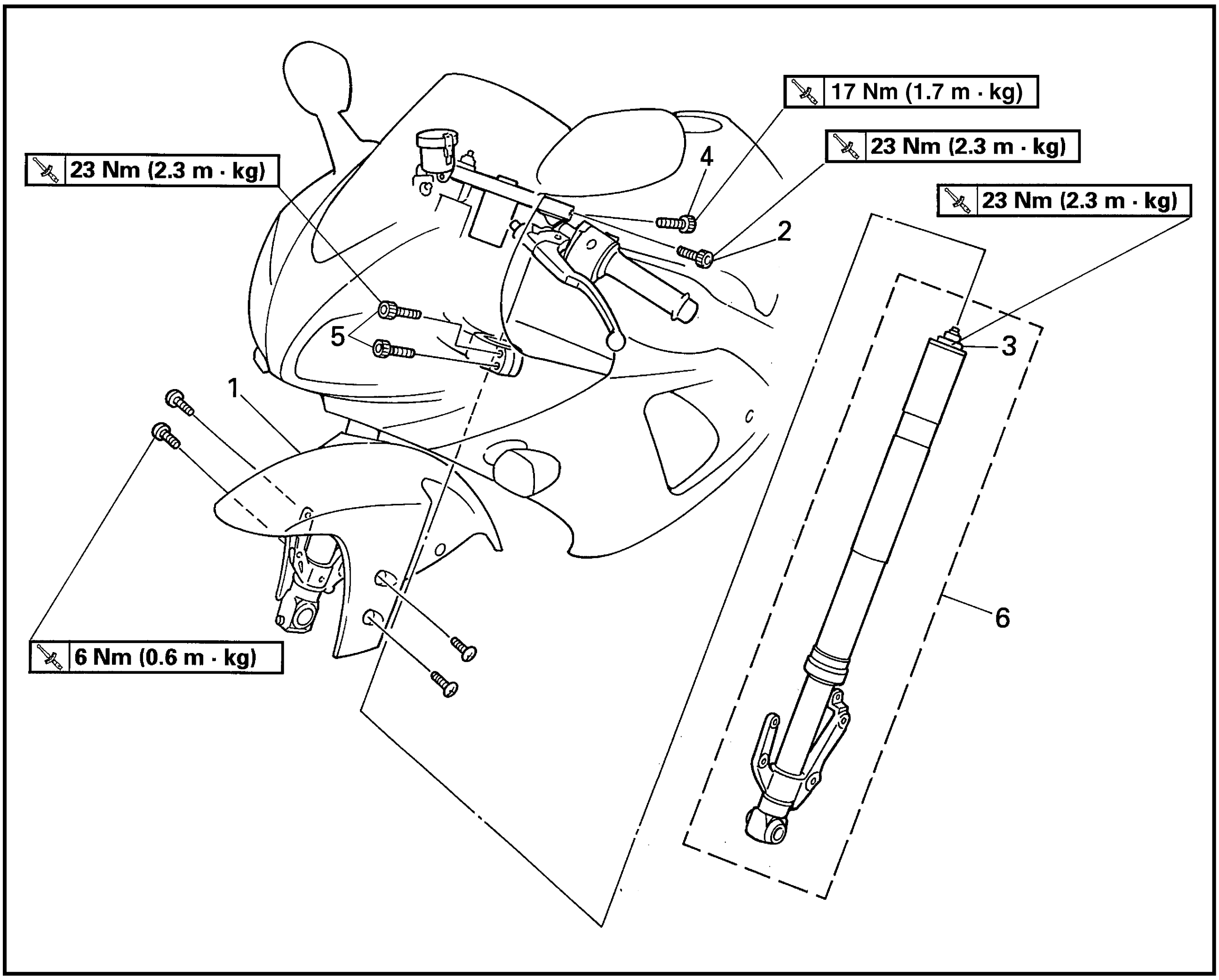


6. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

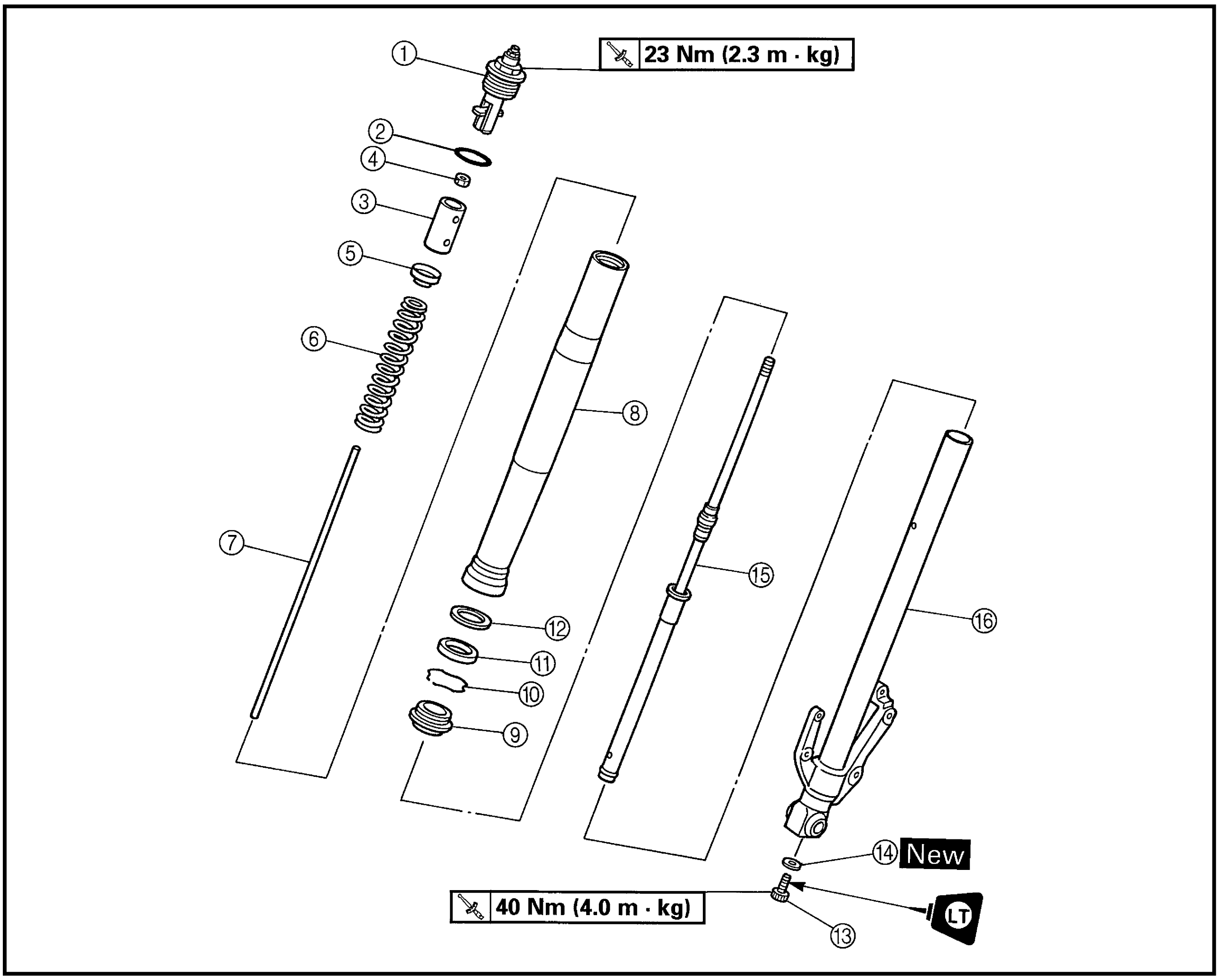
7. Check:
   - brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

EB703001

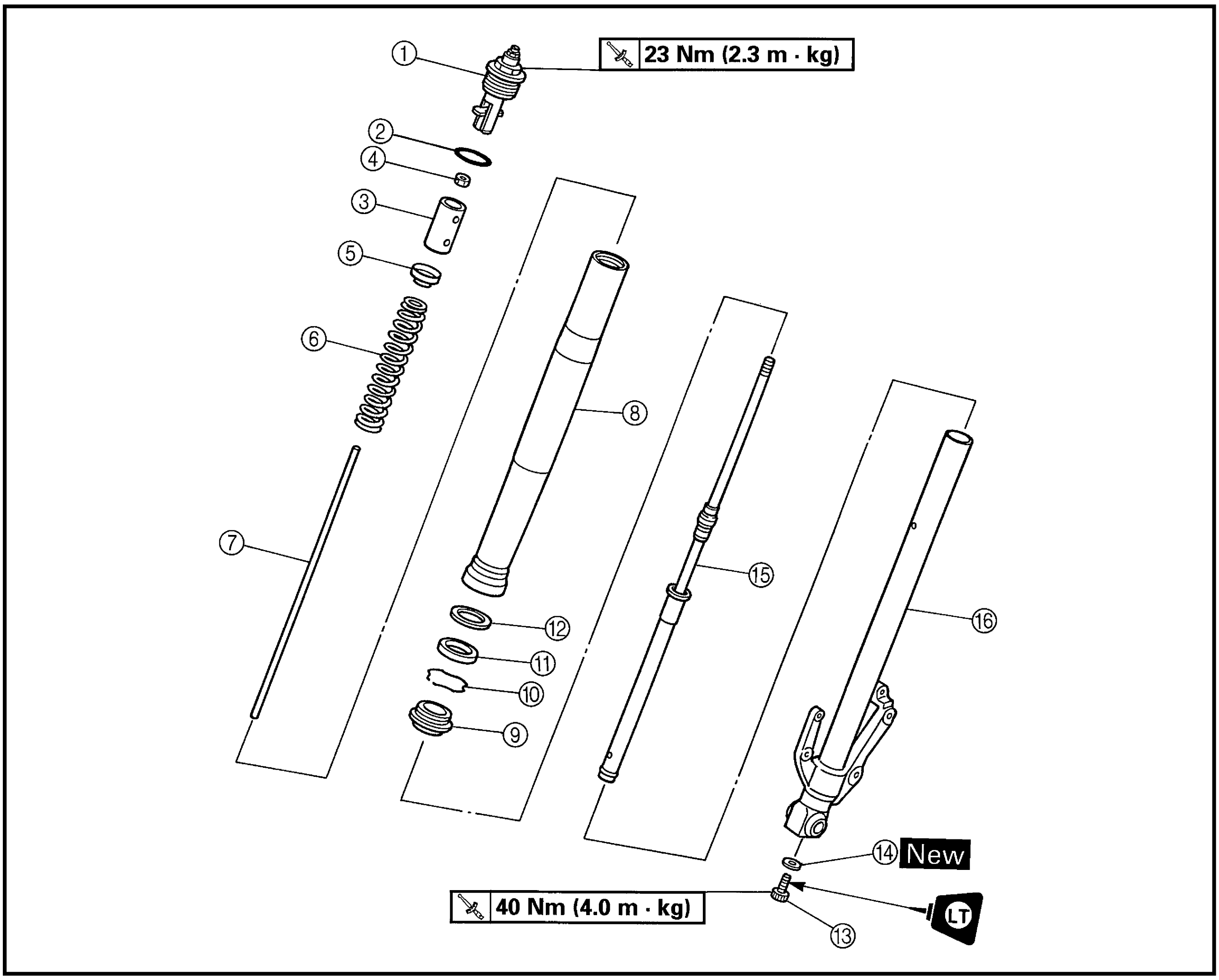
FRONT FORK


17 Nm (1.7 m · kg)
23 Nm (2.3 m · kg)
23 Nm (2.3 m · kg)
23 Nm (2.3 m · kg)
6 Nm (0.6 m · kg)
1
2
3
4
5
6

Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front cowling inner panels		Refer to "COWLINGS" in chapter 3.
1	Front fender	1	
2	Upper bracket pinch bolt	1	
3	Cap bolt	1	
4	Handlebar pinch bolt	1	
5	Lower bracket pinch bolt	2	
6	Front fork leg	1	
			For installation, reverse the removal procedure.


①
23 Nm (2.3 m · kg)
②
④
③
⑤
⑥
⑦
⑧
⑫
⑪
⑩
⑨
⑮
⑯
⑭ New
40 Nm (4.0 m · kg)
⑬
LT

Order	Job/Part	Q'ty	Remarks
	Disassembling the front fork legs		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
①	Cap bolt	1	
②	O-ring	1	
③	Spacer	1	
④	Nut	1	
⑤	Spring seat	1	
⑥	Fork spring	1	
⑦	Damper adjusting rod	1	
⑧	Outer tube	1	
⑨	Dust seal	1	
⑩	Oil seal clip	1	
⑪	Oil seal	1	
⑫	Washer	1	


①
23 Nm (2.3 m · kg)
②
④
③
⑤
⑥
⑦
⑧
⑫
⑪
⑩
⑨
⑮
⑯
⑭ New
40 Nm (4.0 m · kg)
LT
⑬

Order	Job/Part	Q'ty	Remarks
⑬	Damper rod assembly bolt	1	
⑭	Copper washer	1	
⑮	Damper rod assembly	1	
⑯	Inner tube	1	
			For assembly, reverse the disassembly procedure.

EB703100

REMOVING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

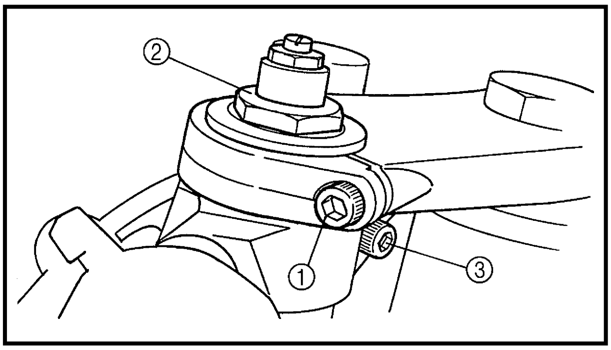
1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

NOTE:

Place the motorcycle on a suitable stand so that the front wheel is elevated.

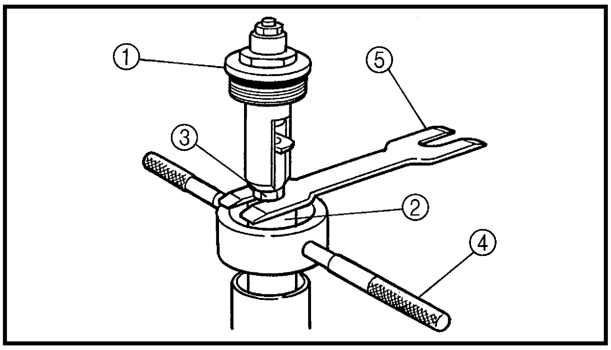


2. Loosen:
   - upper bracket pinch bolt ①
   - cap bolt ②
   - handlebar boss pinch bolt ③
   - lower bracket pinch bolts

⚠ WARNING

Before loosening the upper and lower bracket pinch bolts and handlebar pinch bolt, support the front fork leg.

3. Remove:
   - front fork leg



EB703113

DISASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Remove:
   - cap bolt ①
     (from the damper adjusting rod)
   - spacer ②
   - nut ③

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Press down on the spacer with the fork spring compressor ④.

b. Install the rod holder ⑤ between the nut ③ and the spacer ②.

Fork spring compressor
90890-01441
Rod holder
90890-01434

NOTE:
Use the side of the rod holder that is marked “B”.

c. Loosen the nut.

d. Remove the cap bolt.

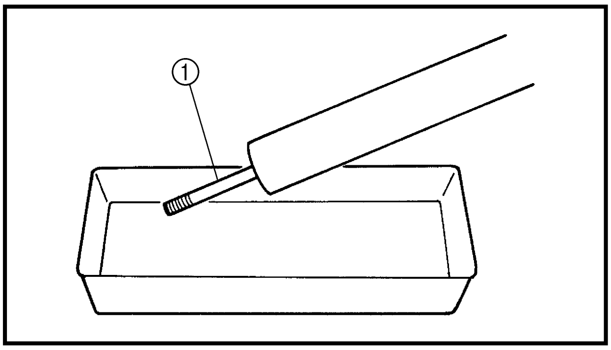
e. Remove the rod holder and fork spring compressor

⚠ WARNING

The fork spring is compressed.

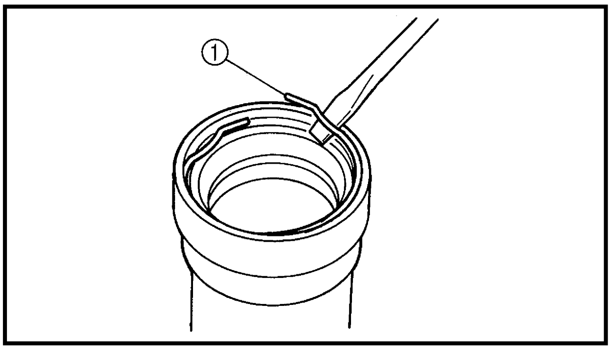
f. Remove the spacer and nut.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

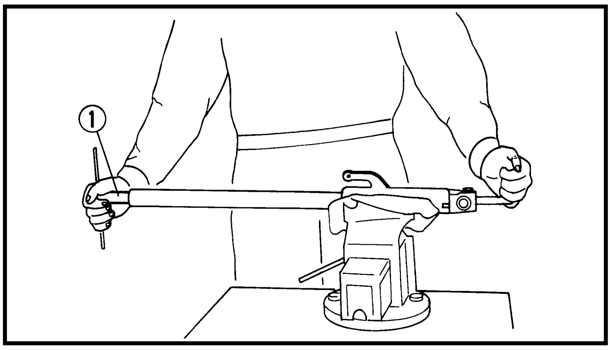


2. Drain:
   - fork oil

NOTE:
Stroke the damper rod ① several times while draining the fork oil.



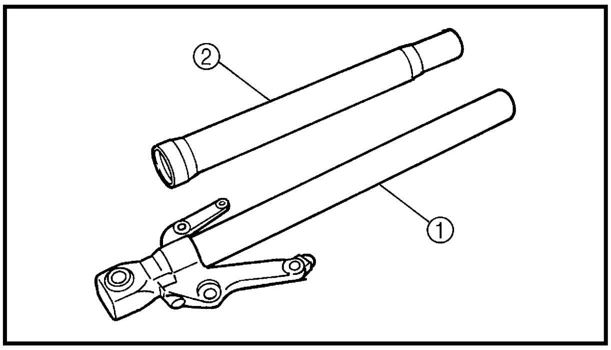
3. Remove:
   - dust seal
   - oil seal clip ①
   - oil seal
   - washer
     (with a flat-head screwdriver)



4. Remove:
   - damper rod assembly bolt
   - copper washer

NOTE:
While holding the damper rod with the damper rod holder ①, loosen the damper rod assembly bolt.

	Damper rod holder **90890-01423**



EB703401

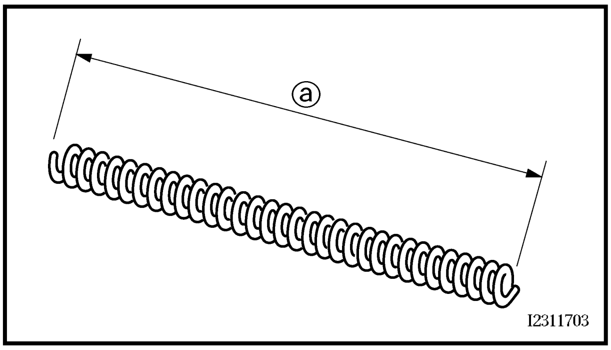
CHECKING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Check:
   - inner tube ①
   - outer tube ②
     Bends/damage/scratches → Replace.

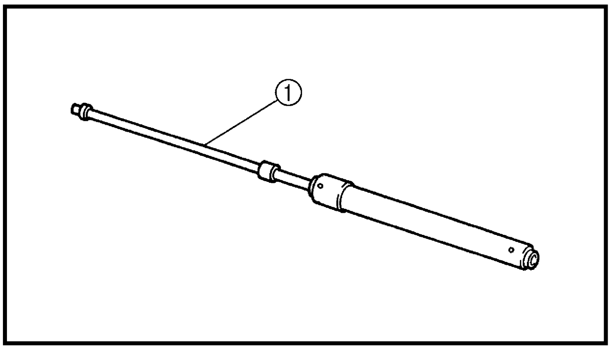
⚠ WARNING

Do not attempt to straighten a bent inner tube as this may dangerously weaken it.



2. Measure:
   - spring free length ⓐ
     Out of specification → Replace.

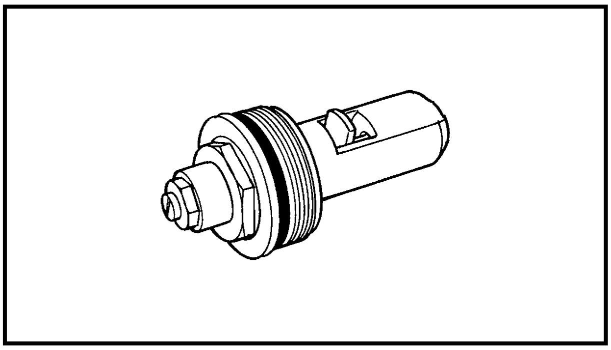
	Spring free length limit **255 mm**



3. Check:
   - damper rod ①
     Damage/wear → Replace.
     Obstruction → Blow out all of the oil passages with compressed air.

CAUTION:

- **The front fork leg has a built-in damper adjusting rod and a very sophisticated internal construction, which are particularly sensitive to foreign material.**
- **When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.**



4. Check:
   - cap bolt O-ring
     Damage/wear → Replace.

EB703702

ASSEMBLING THE FRONT FORK LEGS

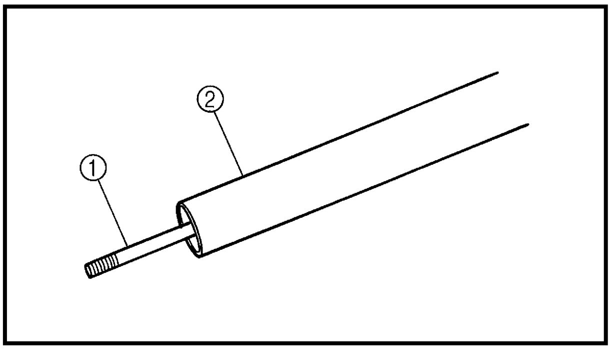
The following procedure applies to both of the front fork legs.

⚠ WARNING

- **Make sure that the oil levels in both front fork legs are equal.**
- **Uneven oil levels can result in poor handling and a loss of stability.**

NOTE:

- When assembling the front fork leg, be sure to replace the following parts:
  - inner tube bushing
  - outer tube bushing
  - oil seal
  - dust seal
- Before assembling the front fork leg, make sure that all of the components are clean.



1. Install:
   - damper rod assembly ①

⚠ WARNING

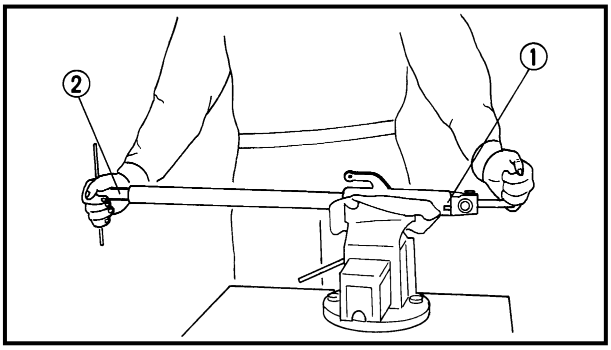
Always use new copper washers.

CAUTION:

Allow the damper rod assembly to slide slowly down the inner tube ② until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.

2. Lubricate:
   - inner tube's outer surface

▬	**Recommended lubricant** **Yamaha fork and shock oil 01 or equivalent**

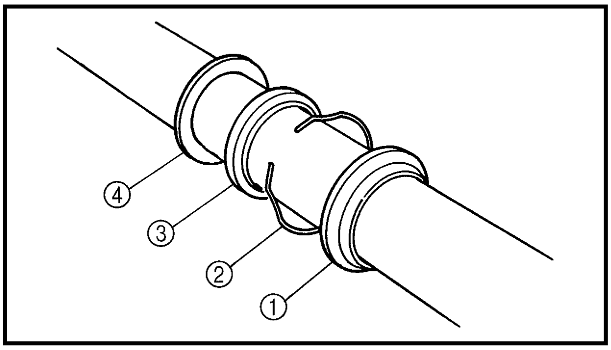


3. Tighten:
   - damper rod assembly bolt ①

40 Nm (4.0 m · kg)

NOTE:
While holding the damper rod with the damper rod holder ②, tighten the damper rod assembly bolt.

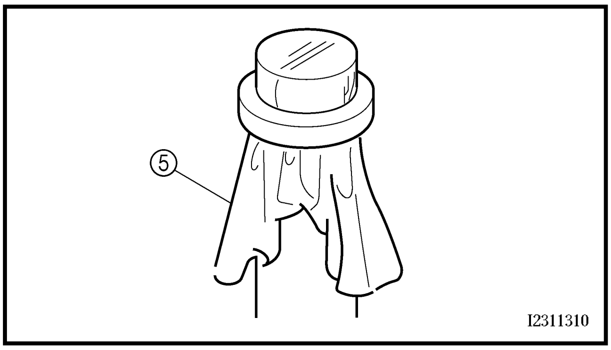
Damper rod holder
90890-01423



4. Install:
   - dust seal ①
   - oil seal clip ②
   - oil seal ③
   - washer ④

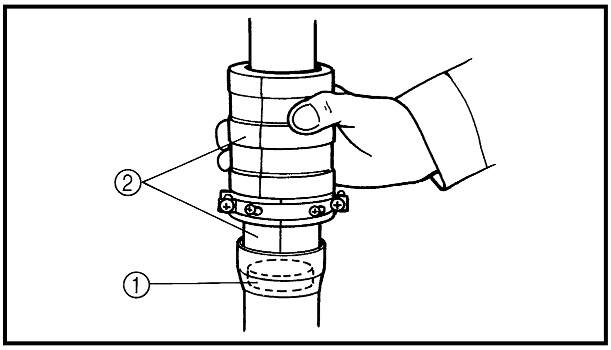
CAUTION:

Make sure that the numbered side of the oil seal faces up.



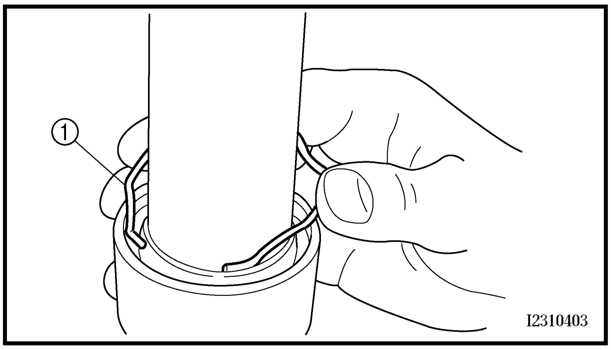
NOTE:
- Before installing the oil seal, lubricate its lips with lithium soap base grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag ⑤ to protect the oil seal during installation.

5. Install:
   - outer tube
     (onto the inner tube)



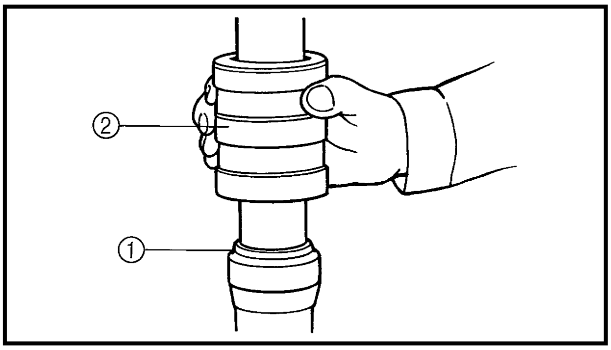
6. Install:
   - washer
   - oil seal ①
     (with the fork seal driver ②)

Fork seal driver
90890-01442

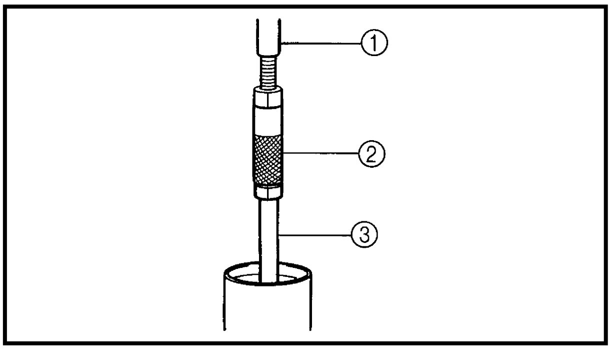


7. Install:
   - oil seal clip ①

NOTE:
Adjust the oil seal clip so that it fits into the outer tube's groove.



8. Install:
   - dust seal ①
     (with the fork seal driver ②)



9. Install:
   - rod puller ①
   - adapter ②
     (onto the damper rod ③)

Rod puller
90890-01437
Adapter
90890-01436

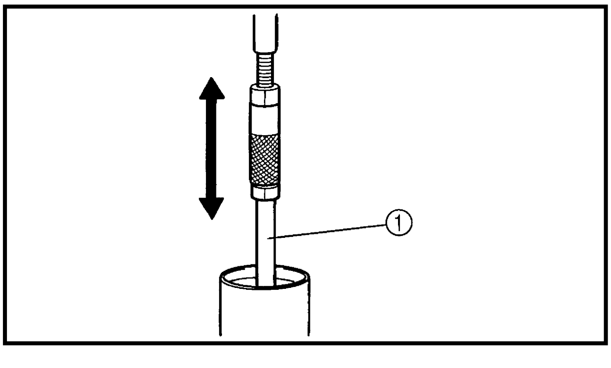
10. Fully compress the front fork leg.

11. Fill:
    - front fork leg
      (with the specified amount of the recommended fork oil)

Quantity (each front fork leg)
477 cm^3
Recommended oil
Yamaha fork and shock oil 01 or equivalent

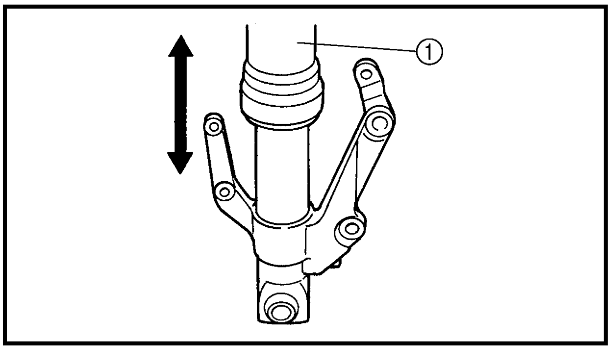
CAUTION:

- **Be sure to use the recommended fork oil. Other oils may have an adverse effect on front fork performance.**
- **When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.**



12. After filling the front fork leg, slowly stroke the damper rod ① up and down (at least ten times) to distribute the fork oil.

NOTE:
Be sure to stroke the damper rod slowly because the fork oil may spurt out.



13.Slowly stroke the outer tube ① up and down to distribute the fork oil once more (1 stroke = about 100 mm).

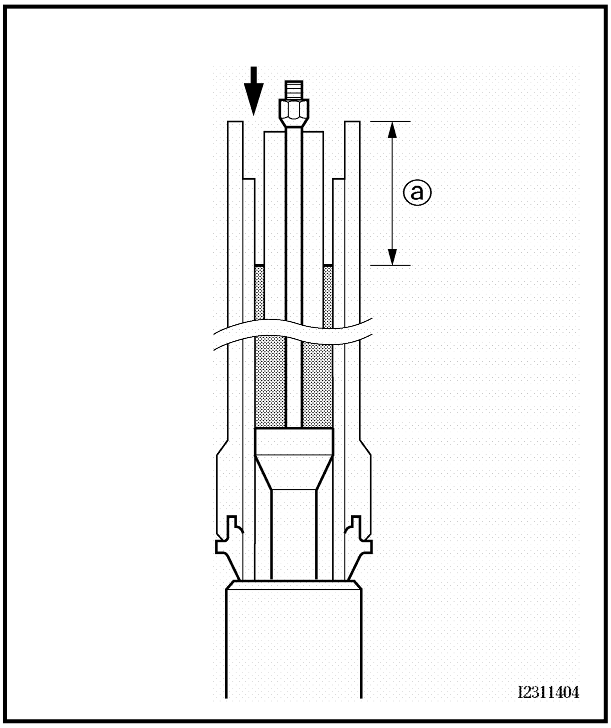
NOTE:

Be careful not to stroke the inner tube over 100 mm as this will cause air to enter. If the inner tube is stroked more than 100 mm, repeat steps (12) and (13).

14.Before measuring the fork oil level, wait ten minutes until the oil has settled and the air bubbles have dispersed.

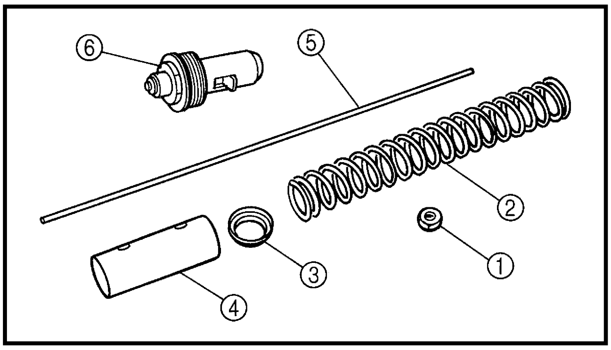
NOTE:

Be sure to bleed the front fork leg of any residual air.



15.Measure:
- front fork leg oil level ⓐ
  Out of specification → Correct.

Front fork leg oil level (from the top of the inner tube, with the inner tube fully compressed, and without the spring)
78 mm

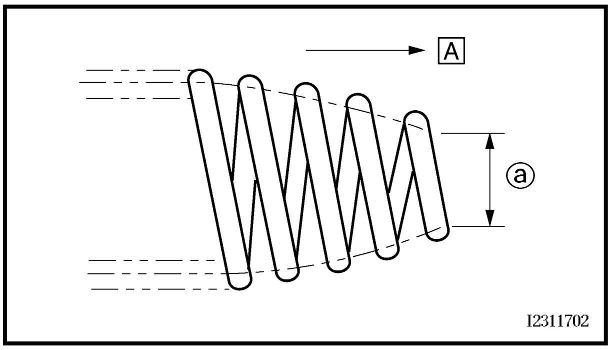


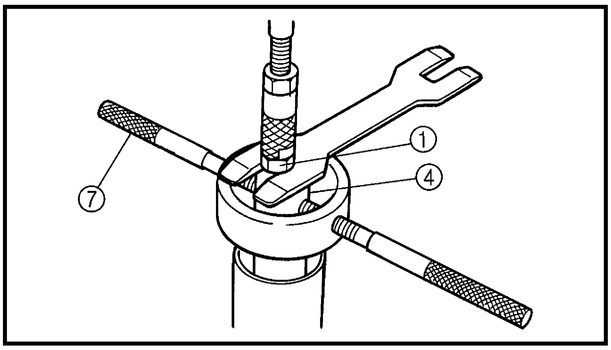
16.Install:
- nut ①
- fork spring ②
- spring seat ③
- spacer ④
- damper adjusting rod ⑤
- cap bolt ⑥

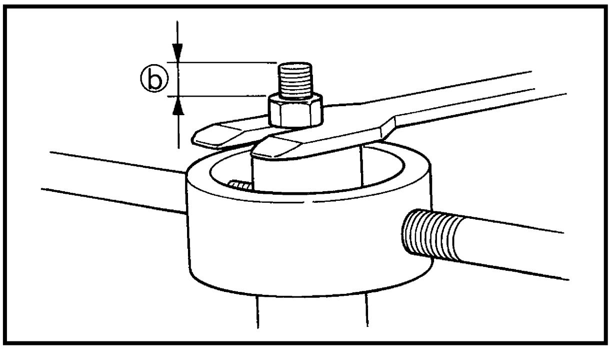
▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the rod puller and adapter.

b. Install the nut.







c. Install the rod puller and adapter onto the damper rod.

Rod puller
90890-01437
Adapter
90890-01436

d. Install the fork spring, spring seat, and spacer.

NOTE:
Install the spring with the smaller pitch ⓐ facing up [A].

e. Press down on the spacer with the fork spring compressor ⑦.

f. Pull up the rod puller and install the rod holder ⑧ between the nut ① and the spacer ④.

NOTE:
Use the side of the rod holder that is marked “B”.

Fork spring compressor
90890-01441
Rod holder
90890-01434

g. Remove the rod puller and adapter.

h. Install the nut ① and position it as specified ⓑ.

Distance ⓑ
11 mm

i. Install the damper adjusting rod and cap bolt, and then finger tighten the cap bolt.

j. Hold the cap bolt and tighten the nut to specification.

Nut
15 Nm (1.5 m • kg)

k. Remove the rod holder and fork spring compressor.

⚠ WARNING

- **The fork spring is compressed.**
- **Always use a new cap bolt O-ring.**

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17. Install:
    - outer tube
      (onto the inner tube)

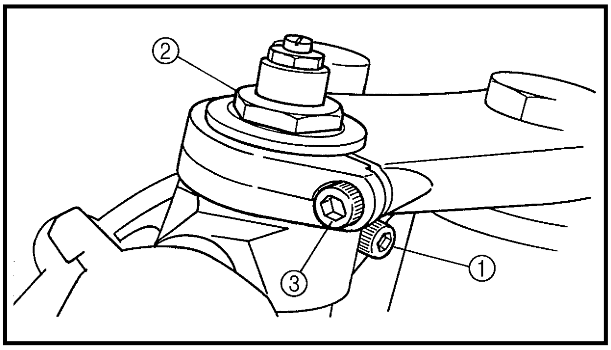
NOTE:
Temporarily tighten the cap bolt.

EB703710
INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Install:
    - front fork leg
      Temporarily tighten the upper and lower bracket pinch bolts.

NOTE:
Make sure that the inner fork tube is flush with the top of the handlebar holder.



2. Tighten:
    - lower bracket pinch bolt
      23 Nm (2.3 m · kg)
    - handlebar pinch bolt ①
      17 Nm (1.7 m · kg)
    - cap bolt ② **23 Nm (2.3 m · kg)**
    - upper bracket pinch bolt ③
      23 Nm (2.3 m · kg)

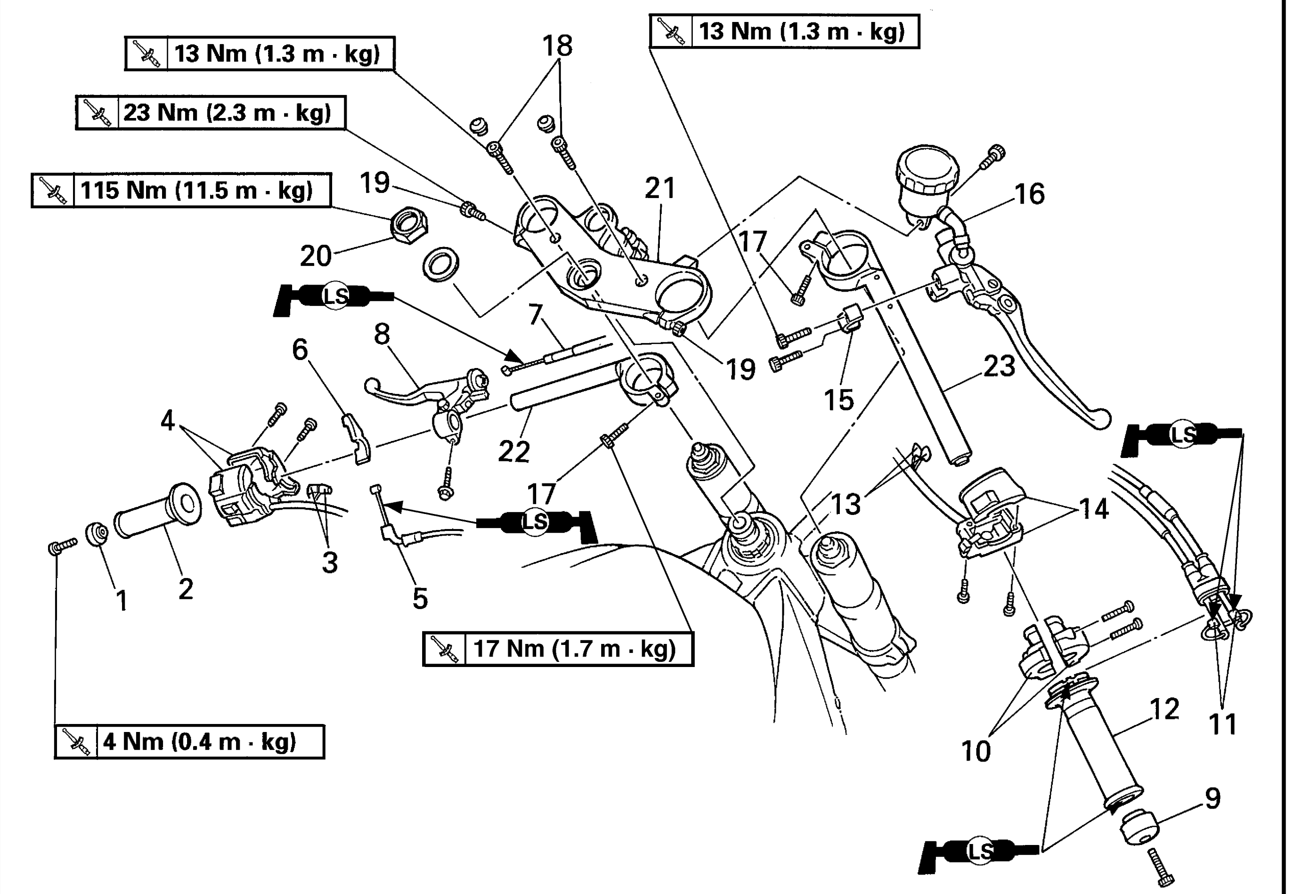
⚠ WARNING

Make sure that the brake hoses are routed properly.

3. Adjust:
    - spring preload
    - rebound damping
    - compression damping
      Refer to “ADJUSTING THE FRONT FORK LEGS” in chapter 3.

EB704001

HANDLEBARS


13 Nm (1.3 m · kg)
23 Nm (2.3 m · kg)
115 Nm (11.5 m · kg)
13 Nm (1.3 m · kg)
17 Nm (1.7 m · kg)
4 Nm (0.4 m · kg)
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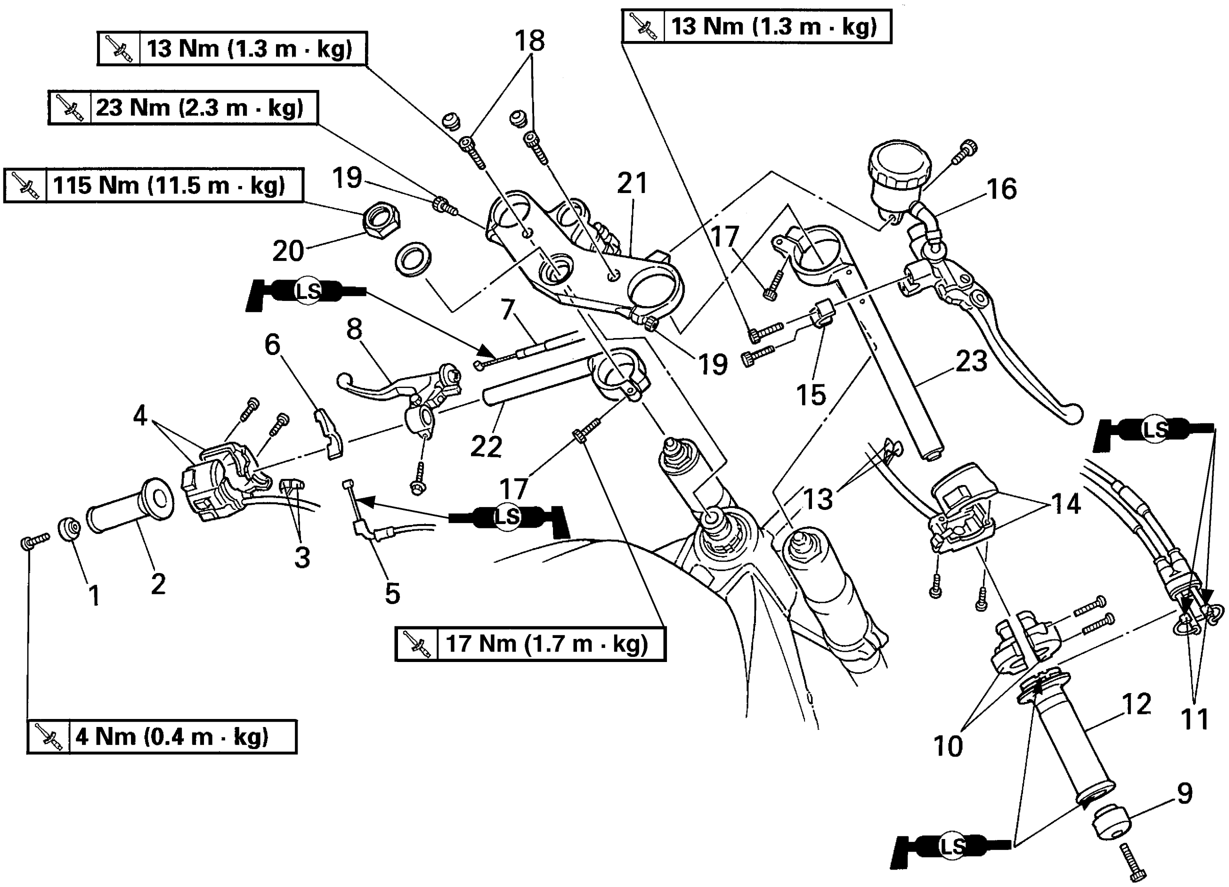
23

Order	Job/Part	Q'ty	Remarks
	Removing the handlebars		Remove the parts in the order listed.
1	Left grip end	1	
2	Handlebar grip	1	
3	Clutch switch connector	2	Disconnect.
4	Left handlebar switch	1	
5	Starter cable	1	Disconnect.
6	Starter lever	1	
7	Clutch cable	1	Disconnect.
8	Clutch lever	1	
9	Right grip end	1	
10	Throttle cable housing	1	
11	Throttle cable	2	
12	Throttle grip	1	


13 Nm (1.3 m · kg)
23 Nm (2.3 m · kg)
115 Nm (11.5 m · kg)
18
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13 Nm (1.3 m · kg)
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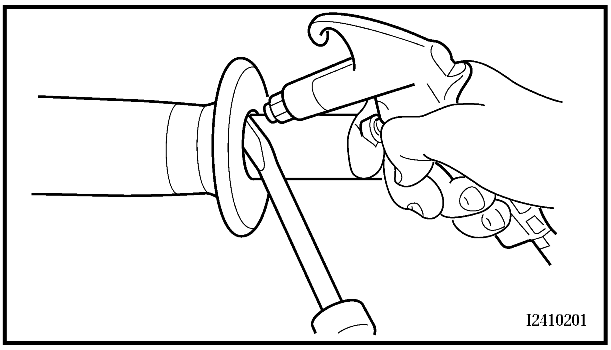
4
22
LS
17
13
14
LS
3
1
2
5
17 Nm (1.7 m · kg)
4 Nm (0.4 m · kg)
10
12
11
9
LS

Order	Job/Part	Q'ty	Remarks
13	Front brake switch connector	2	Disconnect.
14	Right handlebar switch	1	
15	Brake master cylinder holder	1	
16	Brake master cylinder	1	
17	Handlebar pinch bolt	2	
18	Upper bracket bolt	2	
19	Upper bracket pinch bolt	2	
20	Steering stem nut	1	
21	Upper bracket	1	
22	Left handlebar	1	
23	Right handlebar	1	
			For installation, reverse the removal procedure.



EB704101

REMOVING THE HANDLEBARS

1. Stand the motorcycle on a level surface.

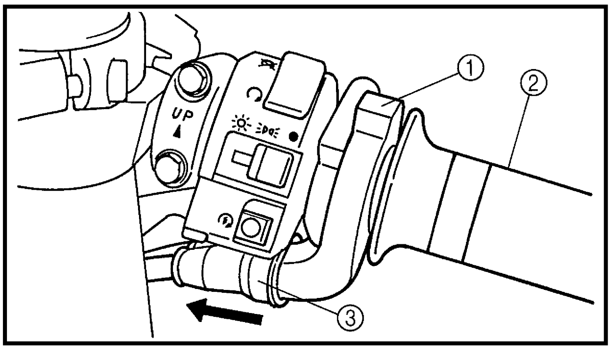
⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

2. Remove:
   - handlebar grip

NOTE:

Blow compressed air between the left handlebar and the handlebar grip, and gradually push the grip off the handlebar.



3. Remove:
   - throttle cable housing ①
   - throttle grip ②

NOTE:

Pull back the rubber cover ③ when removing the throttle cable housing.

EB704401

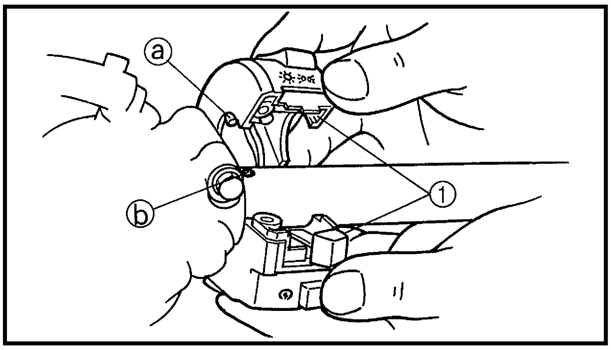
CHECKING THE HANDLEBARS

1. Check:
   - left handlebar
   - right handlebar

   Bends/cracks/damage → Replace.

⚠ WARNING

Do not attempt to straighten bent handlebars as this may dangerously weaken them.



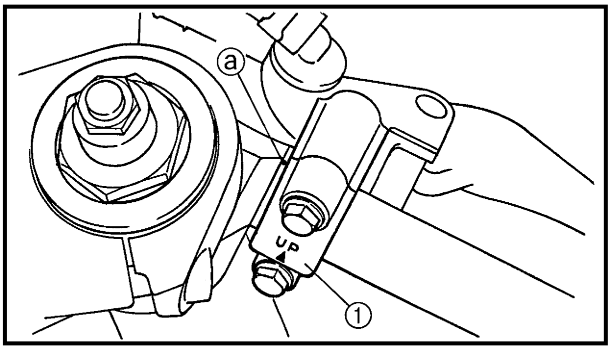
EB704704

INSTALLING THE HANDLEBARS

1. Install:
   - right handlebar switch ①

NOTE:

Align the projection ⓐ on the right handlebar switch with the hole ⓑ in the right handlebar.



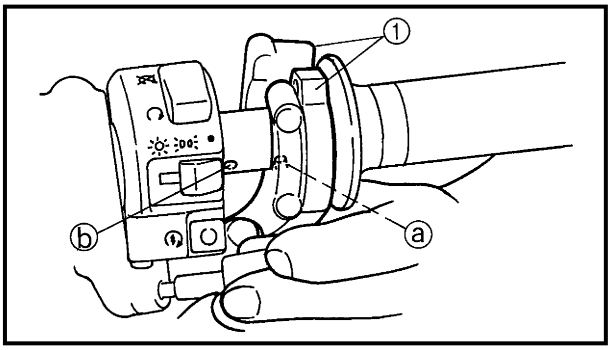
2. Install:
   - brake master cylinder holder ①

CAUTION:

- **Install the brake master cylinder holder with the "UP" mark facing up.**
- **First, tighten the upper bolt, then the lower bolt.**

NOTE:

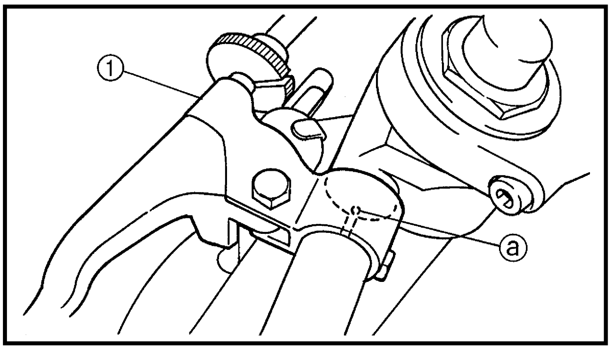
- Align the mating surfaces of the brake master cylinder holder with the punch mark ⓐ in the right handlebar.
- There should be 2 mm of clearance between the right handlebar switch and the brake master cylinder holder.



3. Install:
   - throttle grip ①
   - throttle cable housing ②
   - throttle cables

NOTE:

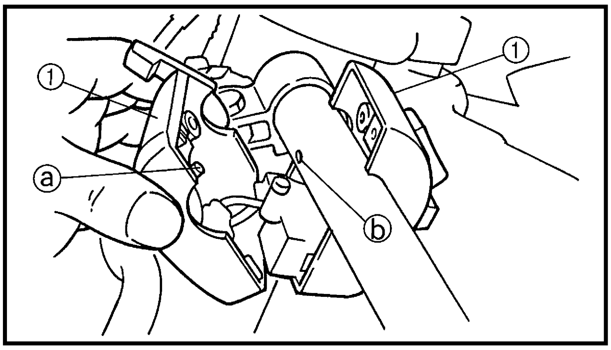
Align the projection ⓐ on the throttle cable housing with the hole ⓑ in the right handlebar.



4. Install:
   - clutch lever holder ①

NOTE:

Align the slit in the clutch lever holder with the punch mark ⓐ in the left handlebar.



5. Install:
   - left handlebar switch ①

NOTE:
Align the projection ⓐ on the left handlebar switch with the hole ⓑ in the left handlebar.

6. Install:
   - handlebar grip

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a. Apply a thin coat of rubber adhesive onto the end of the left handlebar.

b. Slide the handlebar grip over the end of the left handlebar.

c. Wipe off any excess rubber adhesive with a clean rag.

⚠ WARNING

Do not touch the handlebar grip until the rubber adhesive has fully dried.

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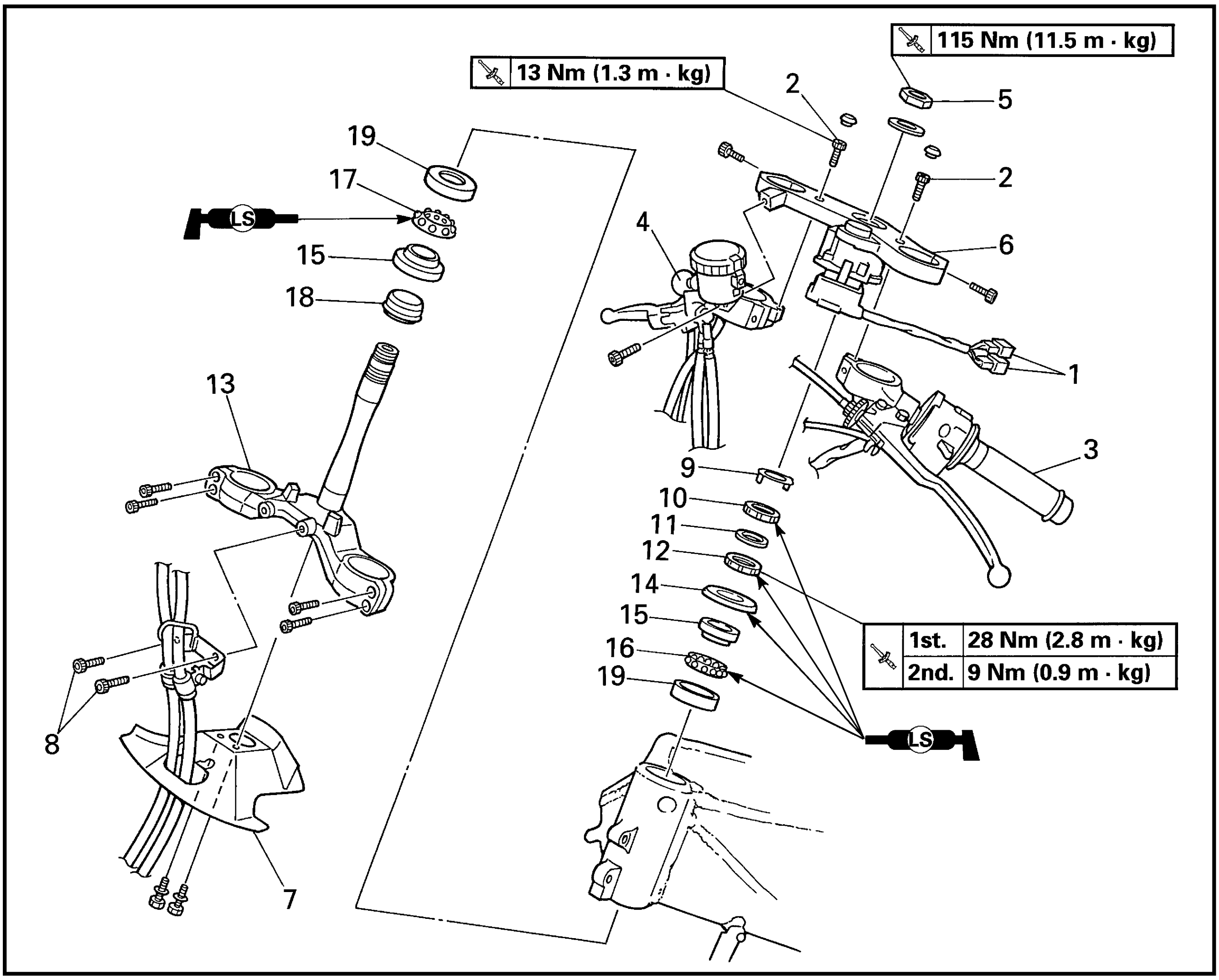
7. Adjust:
   - clutch cable free play
     Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" in chapter 3.

Clutch cable free play (at the end of the clutch lever)
10 ~ 15 mm

8. Adjust:
   - throttle cable free play
     Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

Throttle cable free play (at the flange of the throttle grip)
3 ~ 5 mm

EB705001
STEERING HEAD


13 Nm (1.3 m · kg)
115 Nm (11.5 m · kg)
1st. 28 Nm (2.8 m · kg)
2nd. 9 Nm (0.9 m · kg)
LS
LS
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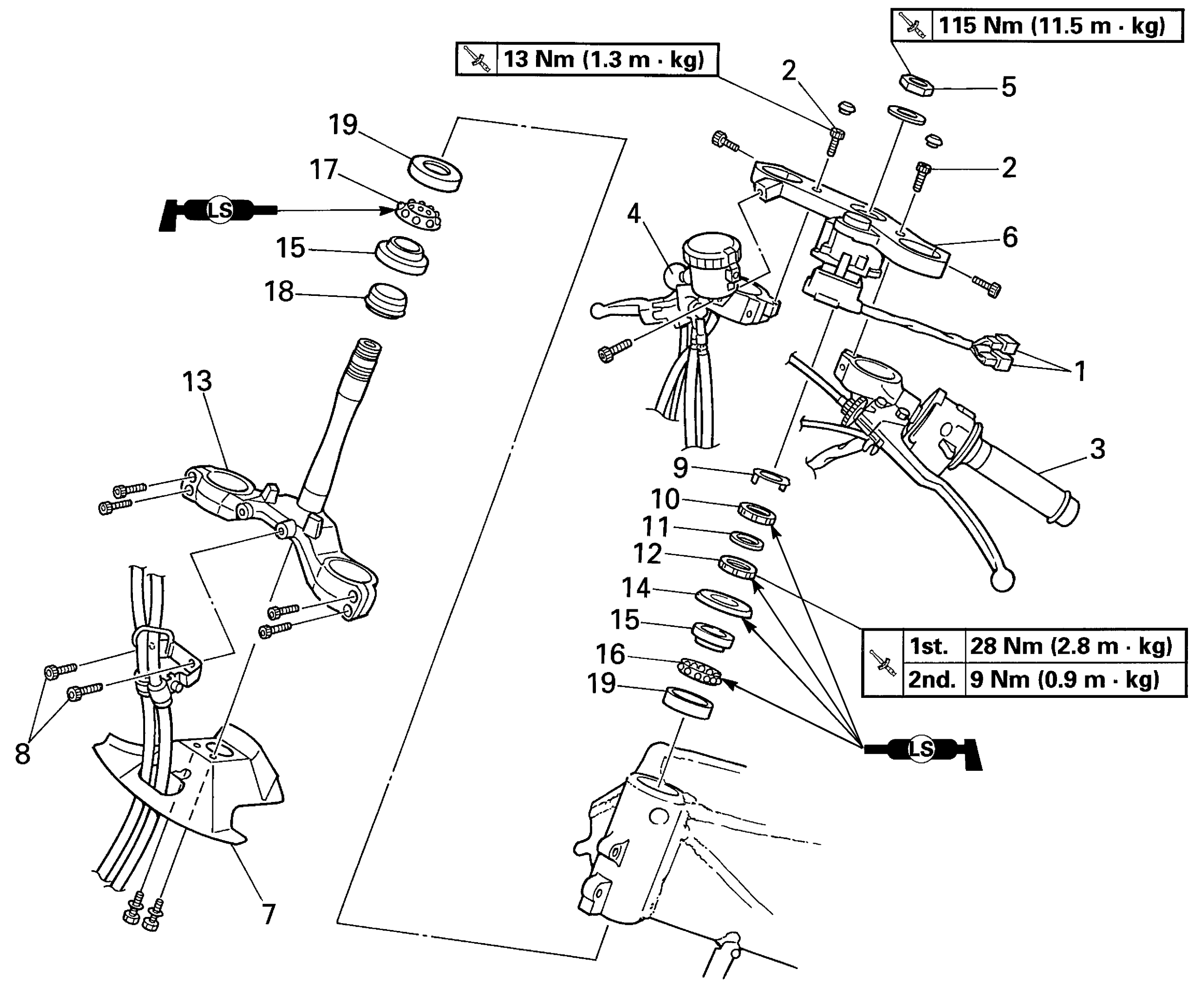
Order	Job/Part	Q'ty	Remarks
	Removing the lower bracket		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front fork legs		Refer to "FRONT FORK".
1	Main switch coupler	2	Disconnect.
2	Upper bracket bolt	2	
3	Left handlebar assembly	1	
4	Right handlebar assembly	1	
5	Steering stem nut	1	
6	Upper bracket	1	
7	Lower bracket panel	1	
8	Brake hose holder bolt	2	
9	Lock washer	1	
10	Upper ring nut	1	
11	Rubber washer	1	


115 Nm (11.5 m · kg)
13 Nm (1.3 m · kg)
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12
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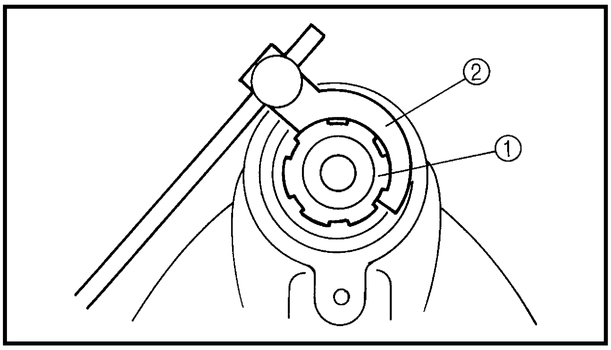
19
1st. 28 Nm (2.8 m · kg)
2nd. 9 Nm (0.9 m · kg)
8
LS
7

Order	Job/Part	Q’ty	Remarks
12	Lower ring nut	1	
13	Lower bracket	1	
14	Bearing cover	1	
15	Bearing inner race	2	
16	Upper bearing	1	
17	Lower bearing	1	
18	Dust seal	1	
19	Bearing outer race	2	
			For installation, reverse the removal procedure.



EB705100
REMOVING THE LOWER BRACKET

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

2. Remove:
   - lower ring nut ①
     (with the special tool ②)

	Ring nut wrench **90890-01403**

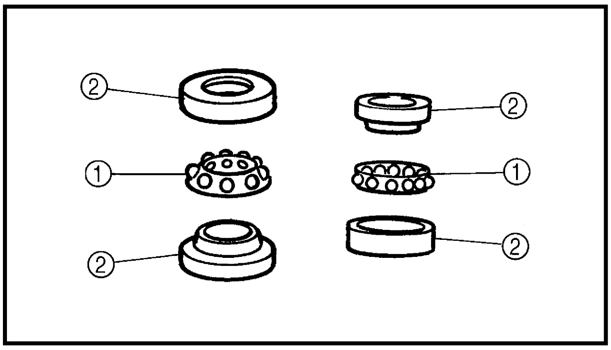
⚠ WARNING

Securely support the lower bracket so that there is no danger of it falling.

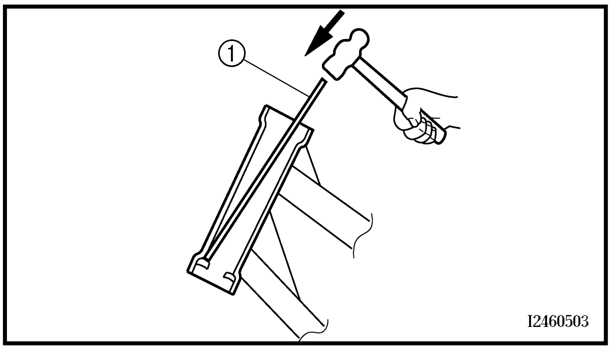
EB705401
CHECKING THE STEERING HEAD

1. Wash:
   - bearing balls
   - bearing races

	Recommended cleaning solvent **Kerosine**



2. Check:
   - bearing balls ①
   - bearing races ②
     Damage/pitting → Replace.



3. Replace:
   - bearing balls
   - bearing races

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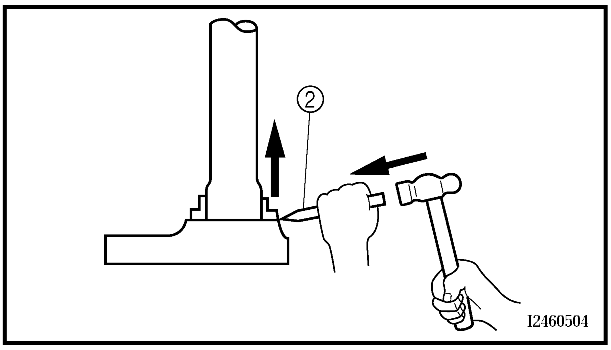
a. Remove the bearing races from the steering head pipe with a long rod ① and hammer.



b. Remove the bearing race from the lower bracket with a floor chisel ② and hammer.

c. Install a new dust seal and new bearing races.

CAUTION:

If the bearing race is not installed properly, the steering head pipe could be damaged.

NOTE:

- Always replace the bearing balls and bearing races as a set.
- Whenever the steering head is disassembled, replace the dust seal.

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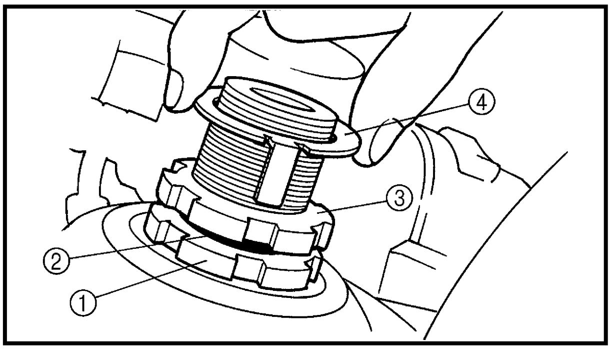
4. Check:
   - upper bracket
   - lower bracket
     (along with the steering stem)
     Bends/cracks/damage → Replace.

EB705700
INSTALLING THE STEERING HEAD

1. Lubricate:
   - upper bearing
   - lower bearing
   - bearing races

▬■	**Recommended lubricant** **Lithium soap base grease**

2. Install:
   - lower ring nut ①
   - rubber washer ②
   - upper ring nut ③
   - lock washer ④
     Refer to “CHECKING AND ADJUSTING THE STEERING HEAD” in chapter 3.



3. Install:
   - upper bracket
   - steering stem nut

NOTE:
Temporarily tighten the steering stem nut.

4. Install:
   - front fork legs
     Refer to “FRONT FORK”.

NOTE:
Temporarily tighten the upper and lower bracket pinch bolts, and handlebar pinch bolts.

5. Tighten:
   - steering stem nut

     115 Nm (11.5 m · kg)
   - lower bracket pinch bolt

     23 Nm (2.3 m · kg)
   - upper bracket pinch bolt

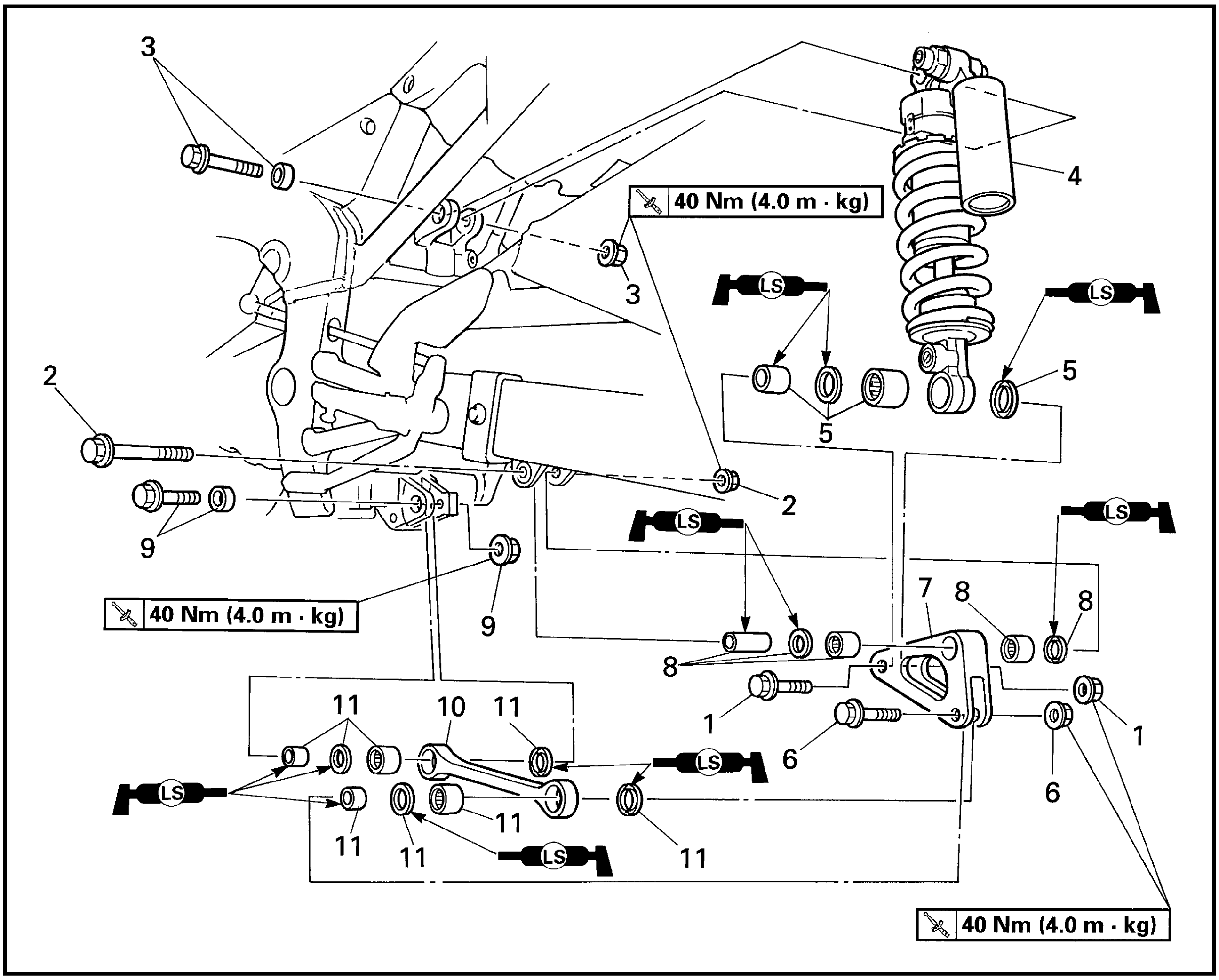
     23 Nm (2.3 m · kg)
   - upper bracket bolt

     13 Nm (1.3 m · kg)
   - handlebar pinch bolt

     17 Nm (1.7 m · kg)

EB706000

REAR SHOCK ABSORBER ASSEMBLY


3
3
4
40 Nm (4.0 m · kg)
3
LS
LS
5
5
2
2
9
LS
LS
9
40 Nm (4.0 m · kg)
9
7
8
8
8
1
1
11
10
11
6
6
LS
LS
11
11
11
11
LS
11
40 Nm (4.0 m · kg)

Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assembly		Remove the parts in the order listed.
1	Self-locking nut/bolt	1/1	Bolt ℓ = 54 mm
2	Self-locking nut/bolt	1/1	Bolt ℓ = 80 mm
3	Self-locking nut/bolt/spacer	1/1/1	Bolt ℓ = 65 mm
4	Rear shock absorber assembly	1	
5	Spacer/oil seal/bearing	1/2/1	
6	Self-locking nut/bolt	1/1	Bolt ℓ = 54 mm
7	Relay arm	1	
8	Spacer/oil seal/bearing	1/2/2	
9	Self-locking nut/bolt/spacer	1/1/1	Bolt ℓ = 65 mm
10	Connecting arm	1	
11	Spacer/oil seal/bearing	2/4/2	
			For installation, reverse the removal procedure.

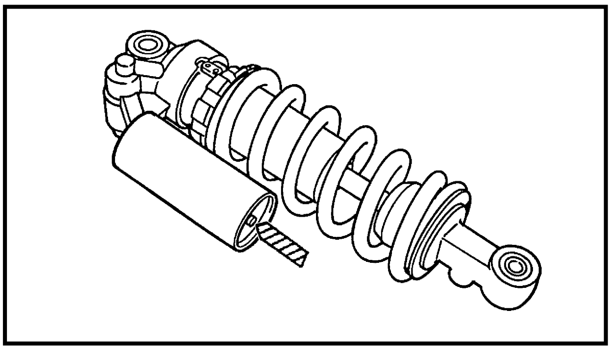
EB706101

HANDLING THE REAR SHOCK ABSORBER AND GAS CYLINDER

⚠ WARNING

This rear shock absorber and gas cylinder contain highly compressed nitrogen gas. Before handling the rear shock absorber or gas cylinder, read and make sure you understand the following information. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling of the rear shock absorber and gas cylinder.

- **Do not tamper or attempt to open the rear shock absorber or gas cylinder.**
- **Do not subject the rear shock absorber or gas cylinder to an open flame or any other source of high heat. High heat can cause an explosion due to excessive gas pressure.**
- **Do not deform or damage the rear shock absorber or gas cylinder in any way. If the rear shock absorber, gas cylinder or both are damaged, damping performance will suffer.**



EB706111

DISPOSING OF A REAR SHOCK ABSORBER AND GAS CYLINDER

Gas pressure must be released before disposing of a rear shock absorber and gas cylinder. To release the gas pressure, press on the gas valve needle with a suitable tool as shown, until all of the gas is released (the hissing has stopped).

⚠ WARNING

Wear eye protection to prevent eye damage from released gas or metal chips.

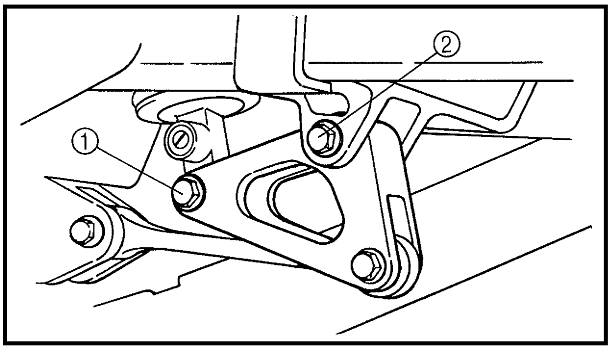
EB706204
REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the motorcycle on a level surface.

⚠ WARNING

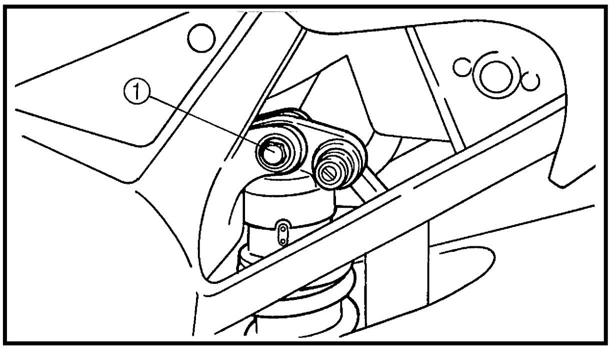
Securely support the motorcycle so that there is no danger of it falling over.

NOTE:
Place the motorcycle on a suitable stand so that the rear wheel is elevated.



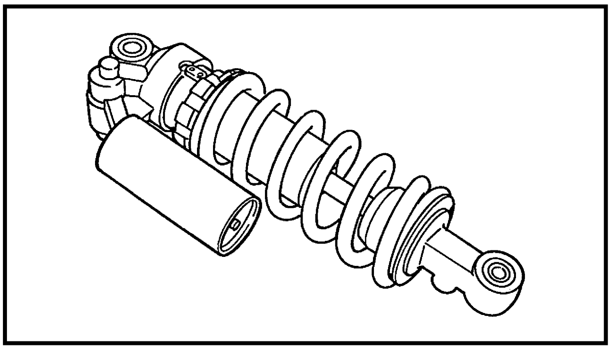
2. Remove:
   - rear shock absorber assembly lower bolt ①
   - relay-arm-to-swingarm bolt ②

NOTE:
While removing the rear shock absorber assembly lower bolt, hold the swingarm so that it does not drop down.



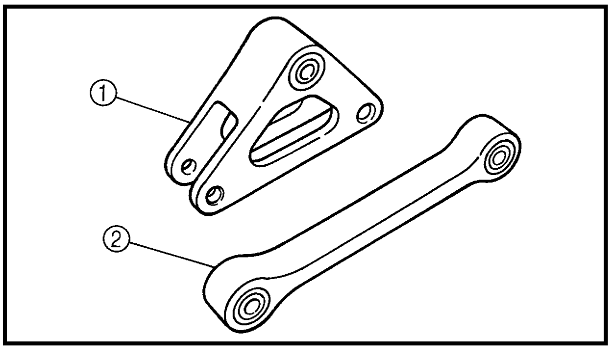
3. Remove:
   - rear shock absorber assembly upper bolt ①
   - rear shock absorber assembly

NOTE:
Raise the swingarm and then remove the rear shock absorber assembly from between the swingarm.



EB706401
CHECKING THE REAR SHOCK ABSORBER ASSEMBLY AND GAS CYLINDER

1. Check:
   - rear shock absorber rod
     Bends/damage → Replace the rear shock absorber assembly.
   - rear shock absorber
     Gas leaks/oil leaks → Replace the rear shock absorber assembly.
   - spring
     Damage/wear → Replace the rear shock absorber assembly.
   - gas cylinder
     Damage/gas leaks → Replace.
   - bushings
     Damage/wear → Replace.
   - dust seals
     Damage/wear → Replace.
   - bolts
     Bends/damage/wear → Replace.



CHECKING THE RELAY ARM AND CONNECTING ARM

1. Check:
   - relay arm ①
   - connecting arm ②
     Damage/wear → Replace.
   - bearings
   - oil seals
     Damage/pitting → Replace.
   - spacers
     Damage/scratches → Replace.

EB706701

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
   - bearings
   - oil seals
   - spacers

Recommended lubricant
Lithium soap base grease

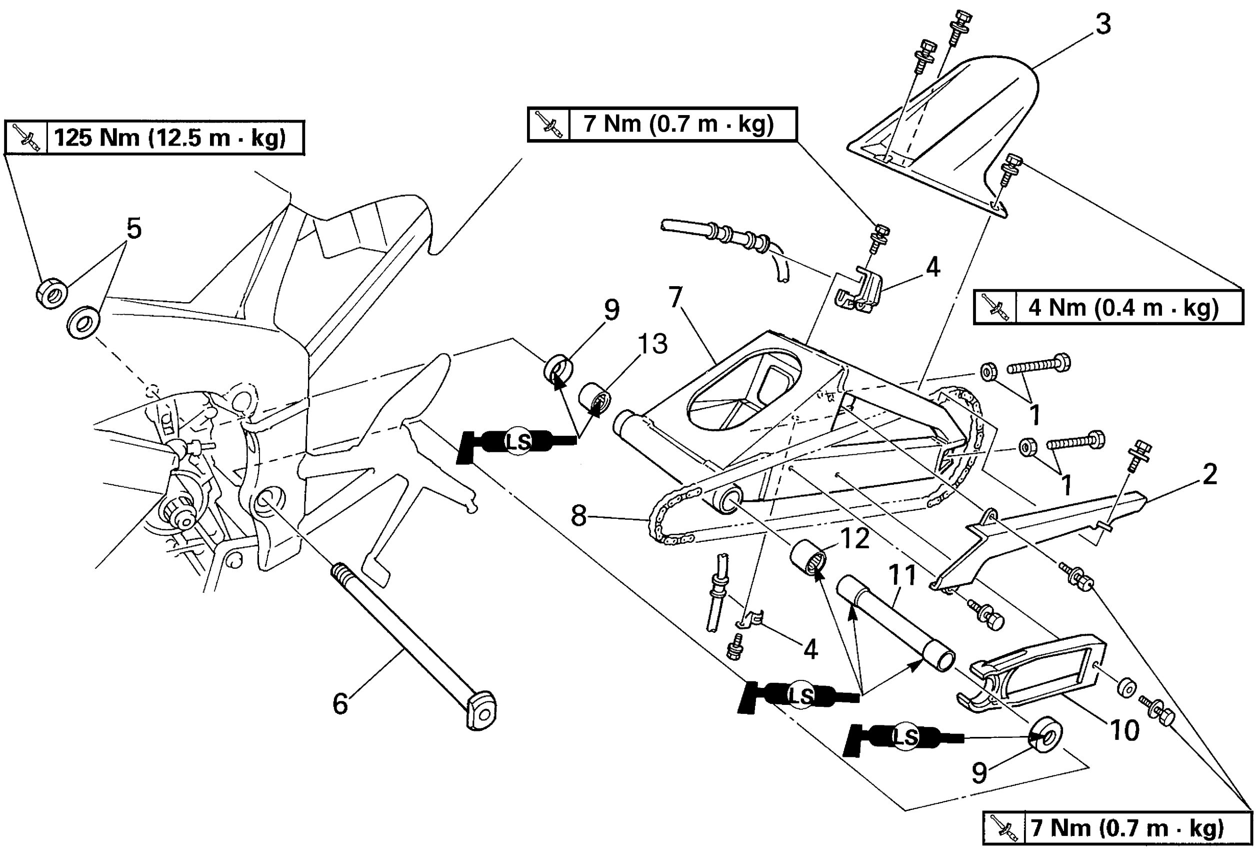
2. Install:
   - connecting arm
   - relay arm
   - rear shock absorber assembly

NOTE:
When installing the rear shock absorber assembly, lift up the swingarm.

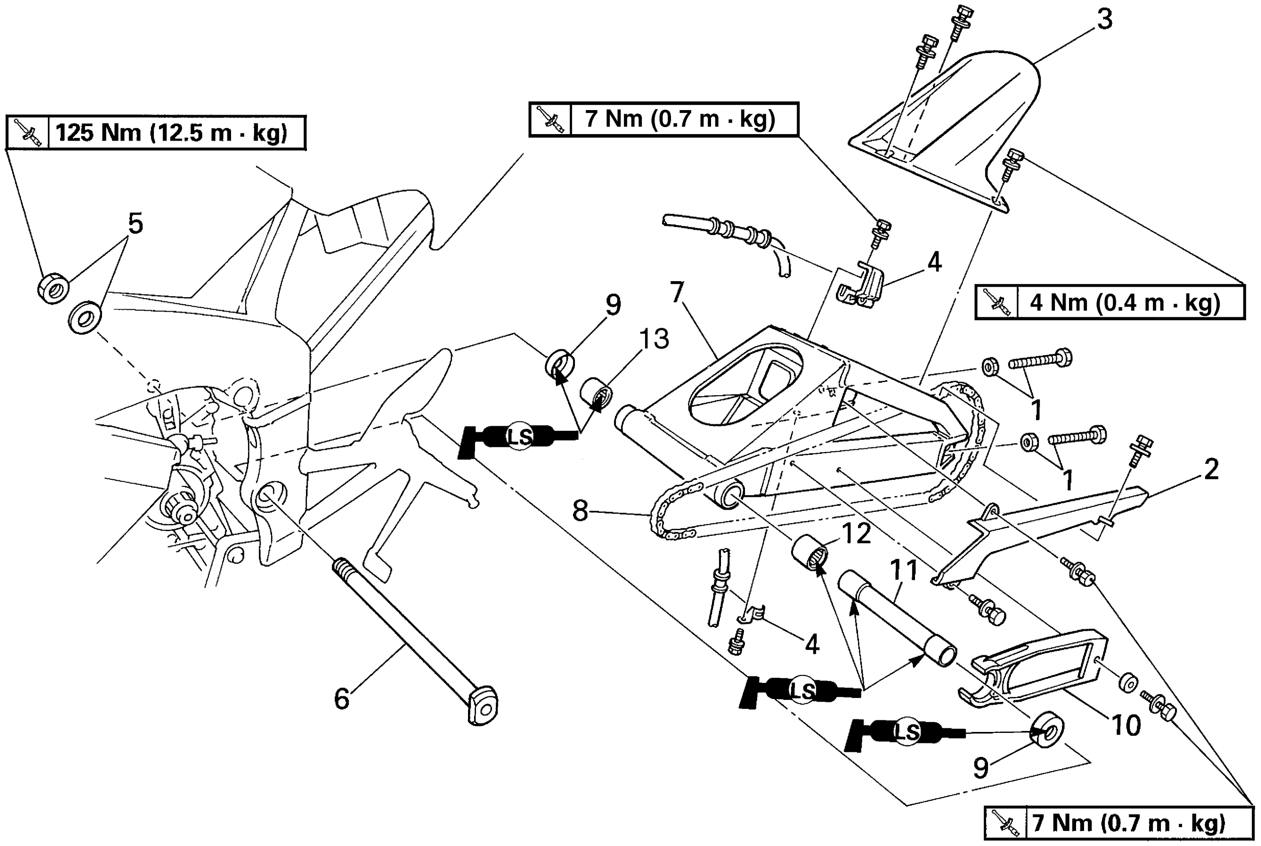
3. Tighten:
   - connecting-arm-to-frame nut
     40 Nm (4.0 m · kg)
   - relay-arm-to-connecting-arm nut
     40 Nm (4.0 m · kg)
   - relay-arm-to-swingarm nut
     40 Nm (4.0 m · kg)
   - rear shock absorber assembly upper nut
     40 Nm (4.0 m · kg)
   - rear shock absorber assembly lower nut
     40 Nm (4.0 m · kg)

EB707000

SWINGARM AND DRIVE CHAIN


125 Nm (12.5 m · kg)
7 Nm (0.7 m · kg)
3
5
4
4 Nm (0.4 m · kg)
9
7
13
1
1
2
8
12
11
4
6
LS
LS
LS
10
9
7 Nm (0.7 m · kg)

Order	Job/Part	Q'ty	Remarks
	Removing the swingarm and drive chain		Remove the parts in the order listed.
	Drive sprocket		Refer to "ENGINE" in chapter 4.
	Rear wheel		Refer to "REAR WHEEL, BRAKE DISC, AND REAR WHEEL SPROCKET".
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY".
1	Adjusting bolt/locknut	2/2	
2	Drive chain guard	1	
3	Rear fender	1	
4	Brake hose holder	2	
5	Pivot shaft nut/washer	1/1	
6	Pivot shaft	1	
7	Swingarm	1	


125 Nm (12.5 m · kg)
7 Nm (0.7 m · kg)
3
4
4 Nm (0.4 m · kg)
5
9
7
13
1
1
2
8
12
11
4
6
LS
LS
LS
10
9
7 Nm (0.7 m · kg)

Order	Job/Part	Q'ty	Remarks
8	Drive chain	1	
9	Dust cover	2	
10	Drive chain guide	1	
11	Spacer	1	
12	Left bearing	1	
13	Right bearing	1	
			For installation, reverse the removal procedure.

EB707100

NOTE:
Before removing the drive sprocket, drive chain, and rear wheel, measure the drive chain slack and the length of a ten-link section of the drive chain.

EB707111

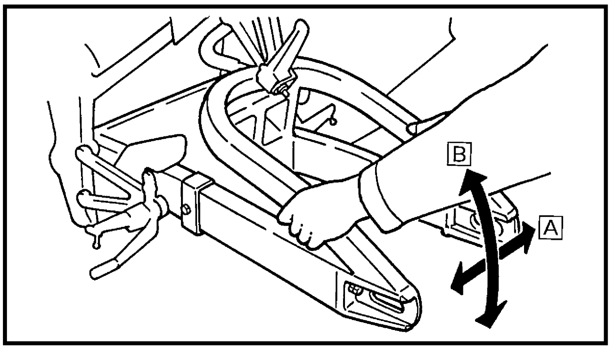
REMOVING THE SWINGARM

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

NOTE:
Place the motorcycle on a suitable stand so that the rear wheel is elevated.



2. Measure:
   - swingarm side play
   - swingarm vertical movement

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a. Measure the tightening torque of the pivot shaft nut.

Pivot shaft nut
125 Nm (12.5 m • kg)

b. Measure the swingarm side play 🄰 by moving the swingarm from side to side.

c. If the swingarm side play is out of specification, check the spacers, bearings, washers, and dust covers.

Swingarm side play (at the end of the swingarm)
1.0 mm

d. Check the swingarm vertical movement 🄱 by moving the swingarm up and down.

If swingarm vertical movement is not smooth or if there is binding, check the spacers, bearings, washers, and dust covers.

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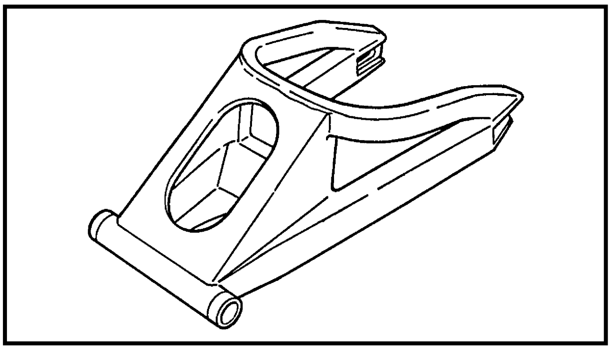
EB707120
REMOVING THE DRIVE CHAIN

1. Remove:
   - drive chain
     (with the drive chain cutter)

	Drive chain cutter **90890-01286**

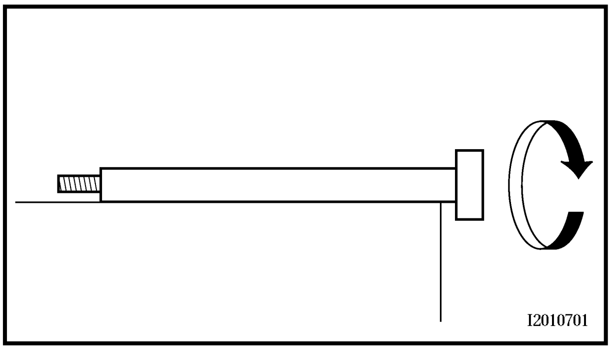
NOTE:
Only cut the drive chain if it or the swingarm is to be replaced.



EB707400
CHECKING THE SWINGARM

1. Check:
   - swingarm
     Bends/cracks/damage → Replace.

NOTE:
If the swingarm must be replaced, the drive chain must be cut with a drive chain cutter.



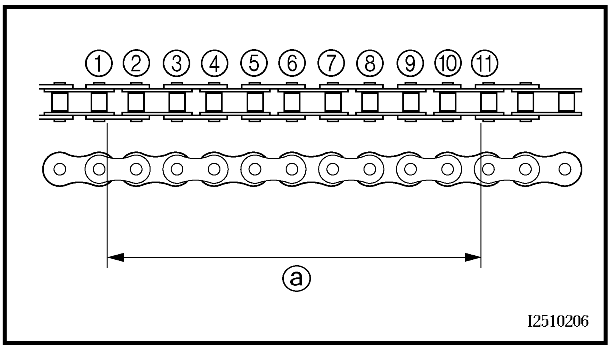
2. Check:
   - pivot shaft
     Roll the pivot shaft on a flat surface.
     Bends → Replace.

⚠ WARNING
Do not attempt to straighten a bent pivot shaft.

3. Wash:
   - pivot shaft
   - dust covers
   - spacer
   - bearings

	Recommended cleaning solvent **Kerosine**

4. Check:
   - dust covers
   - spacer
   - oil seals
     Damage/wear → Replace.
   - bearings
     Damage/pitting → Replace.



EB707410

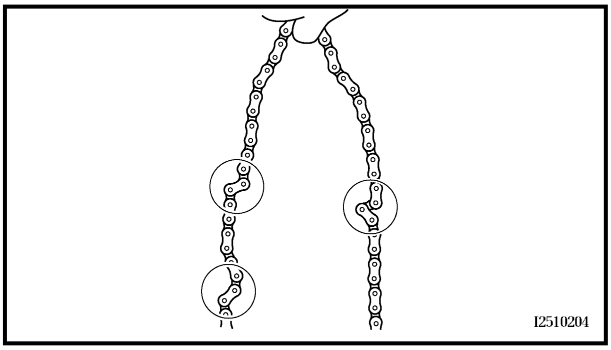
CHECKING THE DRIVE CHAIN

1. Measure:
   - ten-link section ⓐ of the drive chain
     Out of specification → Replace the drive chain.

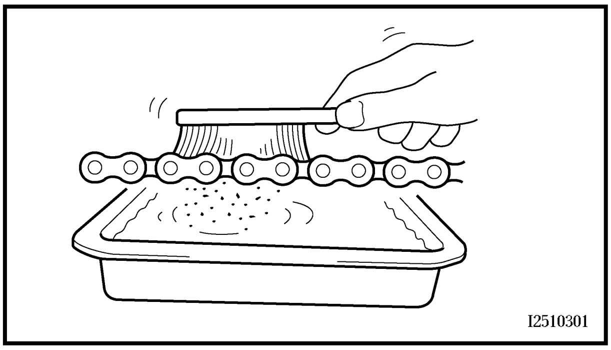
Max. ten-link drive chain section
150.1 mm

NOTE:

- While measuring the ten-link section, push down on the drive chain to increase its tension.
- Measure the length between drive chain roller ① and ⑪ as shown.
- Perform this measurement at two or three different places.



2. Check:
   - drive chain
     Stiffness → Clean and lubricate or replace.

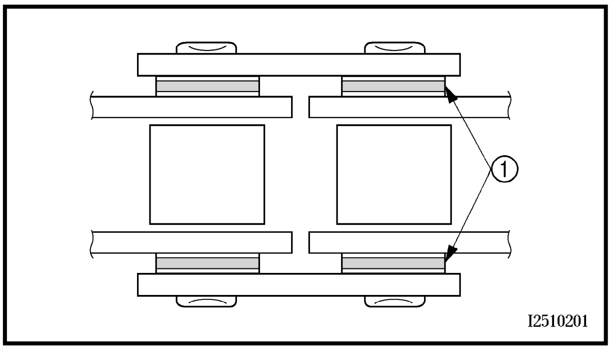


3. Clean:
   - drive chain

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Wipe the drive chain with a clean cloth.

b. Put the drive chain in kerosine and remove any remaining dirt.



c. Remove the drive chain from the kerosine and completely dry it.

CAUTION:

This motorcycle has a drive chain with small rubber O-rings ① between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain's internals, and solvents will deteriorate the O-rings. A coarse brush can also damage the O-rings. Therefore, use only kerosine to clean the drive chain.

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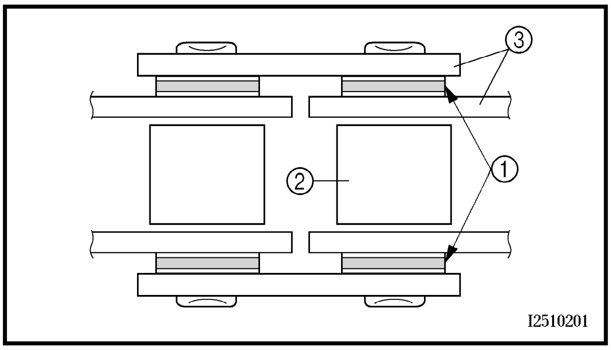
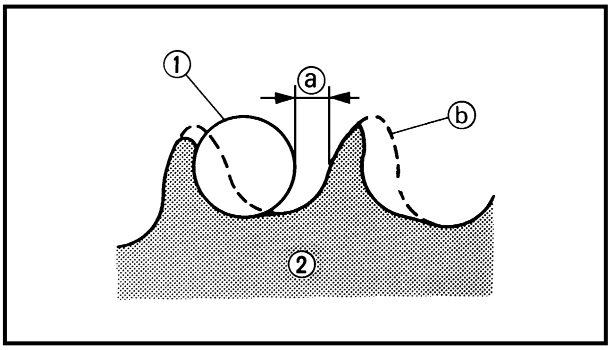


4. Check:
   - O-rings ①
     Damage → Replace the drive chain.
   - drive chain rollers ②
     Damage/wear → Replace the drive chain.
   - drive chain side plates ③
     Cracks/damage/wear → Replace the drive chain.

5. Lubricate:
   - drive chain

-■	**Recommended lubricant** **Engine oil or chain lubricant suitable for O-ring chains**



6. Check:
   - drive sprocket
   - rear wheel sprocket
     More than 1/4 tooth ⓐ wear → Replace the drive chain sprockets as a set.
     Bent teeth → Replace the drive chain sprockets as a set.

ⓑ Correct
① Drive chain roller
② Drive chain sprocket

EB707700

INSTALLING THE SWINGARM

1. Lubricate:
   - bearings
   - spacers
   - dust covers
   - pivot shaft

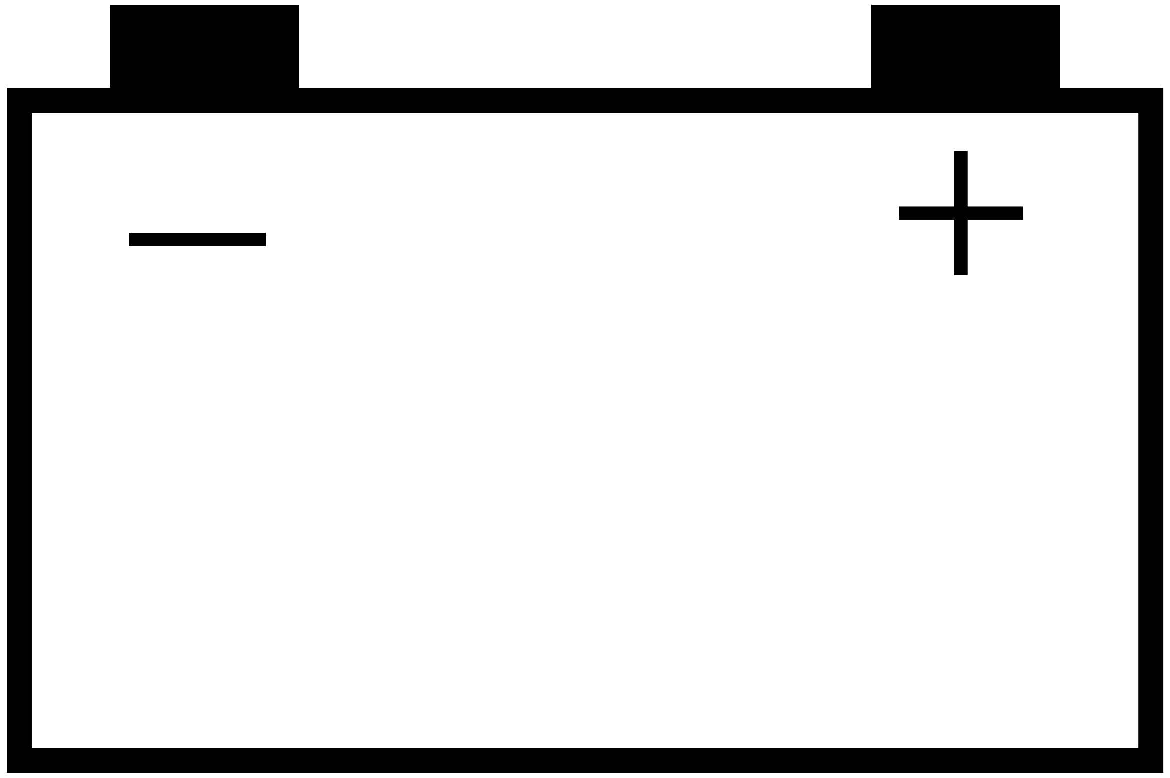
Recommended lubricant
Lithium soap base grease

2. Install:
   - swingarm
   - pivot shaft
   - washer
   - pivot shaft nut **125 Nm (12.5 m · kg)**
3. Install:
   - rear shock absorber assembly
   - rear wheel

     Refer to “REAR SHOCK ABSORBER ASSEMBLY” and “REAR WHEEL”.
4. Adjust:
   - drive chain slack

     Refer to “ADJUSTING THE DRIVE CHAIN SLACK” in chapter 3.

Drive chain slack
40 ~ 50 mm



ELEC

8

CHAPTER 8.
ELECTRICAL

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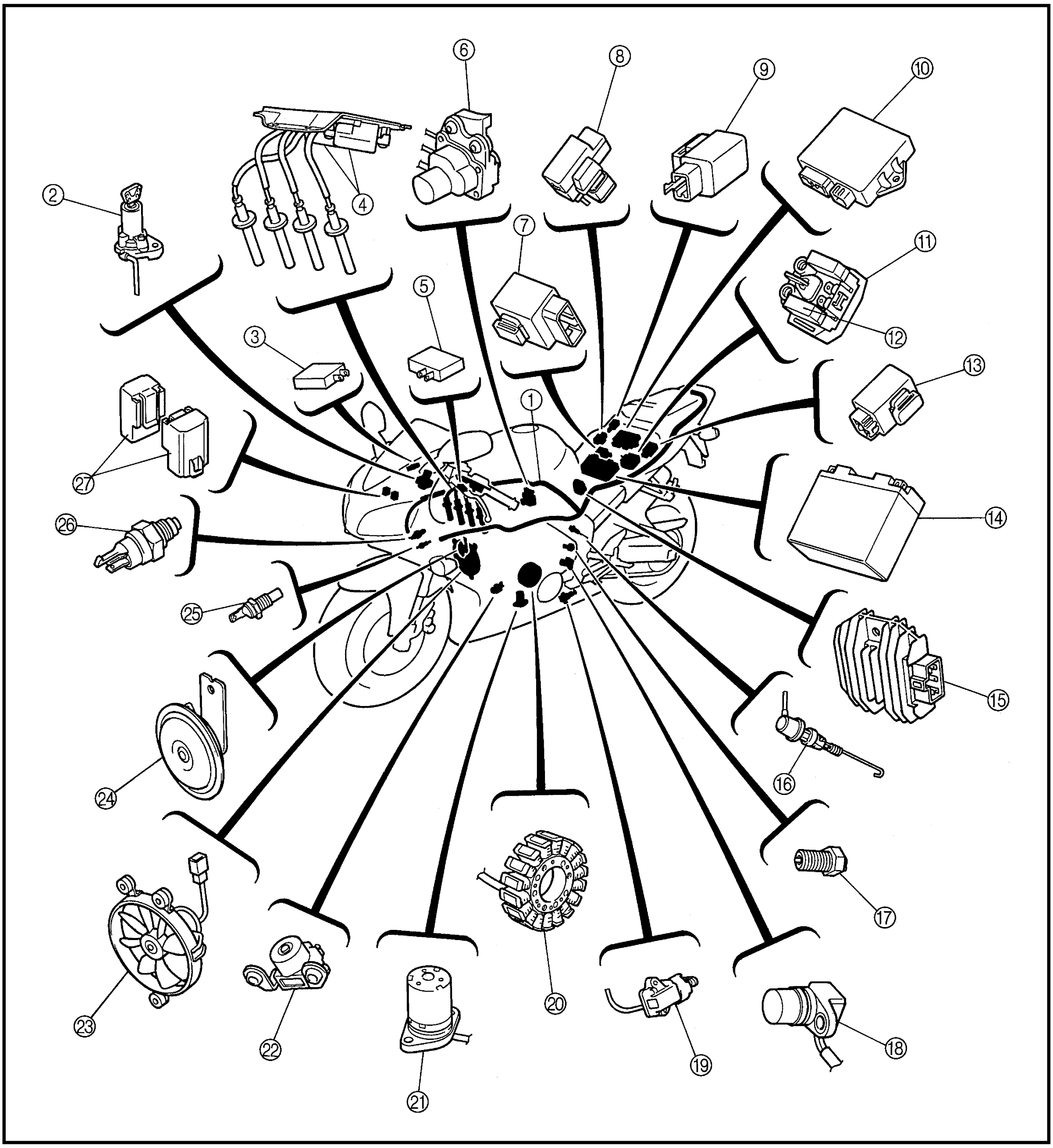
EB800000

ELECTRICAL

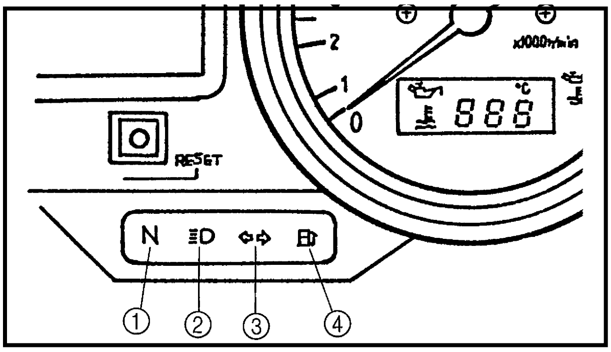
ELECTRICAL COMPONENTS

① Wire harness
② Main switch
③ Front brake light switch
④ Ignition coils
⑤ Clutch switch
⑥ EXUP servomotor
⑦ Relay unit
⑧ Fuse box
⑨ Turn signal relay
⑩ Ignitor unit
⑪ Starter relay
⑫ Main fuse
⑬ Oil level relay
⑭ Battery
⑮ Rectifier/regulator
⑯ Rear brake light switch
⑰ Neutral switch
⑱ Speed sensor
⑲ Sidestand switch
⑳ Stator coil assembly
㉑ Oil level switch
㉒ Pickup coil
㉓ Radiator fan
㉔ Horn
㉕ Temperature sender
㉖ Thermo switch
㉗ Headlight relay



INSTRUMENT FUNCTIONS

INDICATOR LIGHTS



① Neutral indicator light " N "
② High beam indicator light "≣D"
③ Turn indicator light " ⇦ ⇨ "
④ Fuel indicator light " ⛽ "

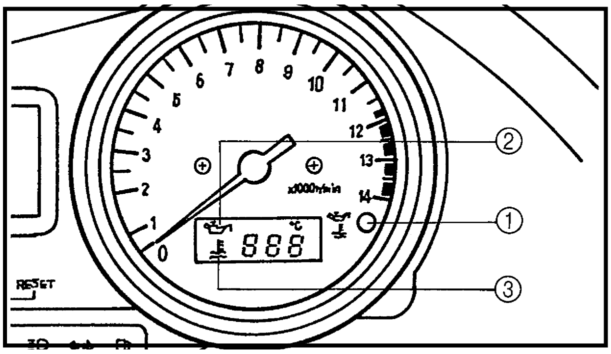
Turn indicator light " ⇦ ⇨ "
This indicator flashes when the turn switch is moved to the left or right.

Neutral indicator light " N "
This indicator comes on when the transmission is in neutral.

High beam indicator light "≣D"
This indicator comes on when the headlight high beam is used.

Fuel indicator light " ⛽ "
When the fuel level drops below approximately 5.5 L, this light will come on. When this light comes on, fill the fuel tank at the first opportunity.

OIL LEVEL/COOLANT TEMPERATURE WARNING LIGHT



① Oil level/coolant temperature warning light " 🛢 🌡 "
② Oil level symbol " 🛢 "
③ Coolant temperature symbol " 🌡 "

This warning light has two functions.

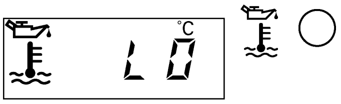
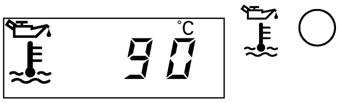
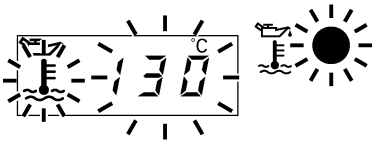
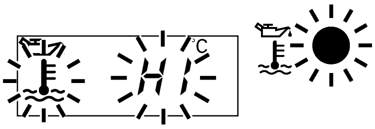
- The light will come on and symbol " 🛢 " will flash if the engine oil level is low. If this symbol flashes, stop the engine immediately and fill it with oil to the specified level.
- The light will come on and symbol " 🌡 " will flash if the coolant temperature is too high. The following chart shows the conditions of the indicator light, symbol and temperature display in accordance with the coolant temperature.

CAUTION:

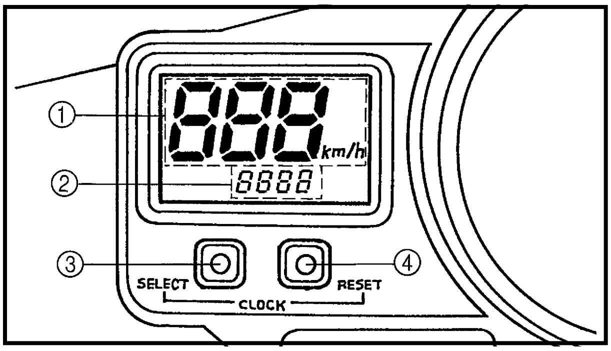
- **Do not run the motorcycle until you know it has sufficient engine oil.**
- **Do not run the motorcycle if the engine is overheated.**

NOTE:

Even if the oil is filled to the specified level, the warning light may flicker when riding on a slope or during sudden acceleration or deceleration, but this is normal.

Coolant temperature	Display	Conditions	What to do
0 °C ~ 40 °C		Symbol is on and “LO” is displayed.	Go ahead with riding.
41 °C ~ 117 °C		Symbol is on and temperature is displayed.	Go ahead with riding.
118 °C ~ 140 °C		Symbol and temperature flashes and indicator light comes on.	Stop the motorcycle and allow it to idle until the coolant temperature goes down. If the temperature does not go down, stop the engine. Refer to “OVERHEATING” in chapter 9.
141 °C ~		Symbol flashes, “HI” is displayed and flashes, and the indicator light comes on.	Stop the engine and allow it to cool. Refer to “OVERHEATING” in chapter 9.

COMBINATION METER



① Speedometer
② Clock, odometer
③ “SELECT” button
④ “RESET” button

This combination meter is equipped with the following.

- A speedometer
- An odometer
- Two trip odometers
- A fuel reserve tripmeter
- A clock

For GB and USA models only:
To change the speedometer display from kilometers to miles, press the “SELECT” button for at least two seconds.

Odometer and trip meters

Use the trip meters to estimate how far you can ride on a tank of fuel.
Use the fuel reserve trip meter to see the distance traveled from when the fuel level dropped to the reserve level.

Push the “SELECT” button to change between the odometer mode “ODO” and the trip odometer modes “TRIP 1” and “TRIP 2” in the following order:
“ODO” → “TRIP 1” → “TRIP 2” → “ODO”

When the fuel level indicator light comes on the odometer display will automatically change to the fuel reserve trip meter mode "TRIP F" and start counting the distance traveled from that point. Push the "SELECT" button to change between the fuel odometer, trip odometer and odometer modes in the following order:
"TRIP F" → "TRIP 1" → "TRIP 2" → "ODO" → "TRIP F"

To reset a trip odometer to 0.0, select it by pushing the "SELECT" button and push the "RESET" button for at least one second. To reset the fuel reserve trip meter, select it by pushing the "SELECT" button and push the "RESET" button for at least one second. The display will return to "TRIP 1". If you do not reset the fuel reserve trip meter manually, it will automatically reset and return to "TRIP 1" after refueling and the motorcycle has traveled both 5 km and for approximately 3 minutes.

Clock

To change the display to the clock mode, push both the "SELECT" and "RESET" buttons.
To set the clock:

1. Push both the "SELECT" and "RESET" buttons for at least two seconds.
2. When the hour digits start flashing, push the "RESET" button to set the hours.
3. Push the "SELECT" button to change the minutes.
4. When the minute digits start flashing, push the "RESET" button to set the minutes.
5. Push the "SELECT" button to start the clock.

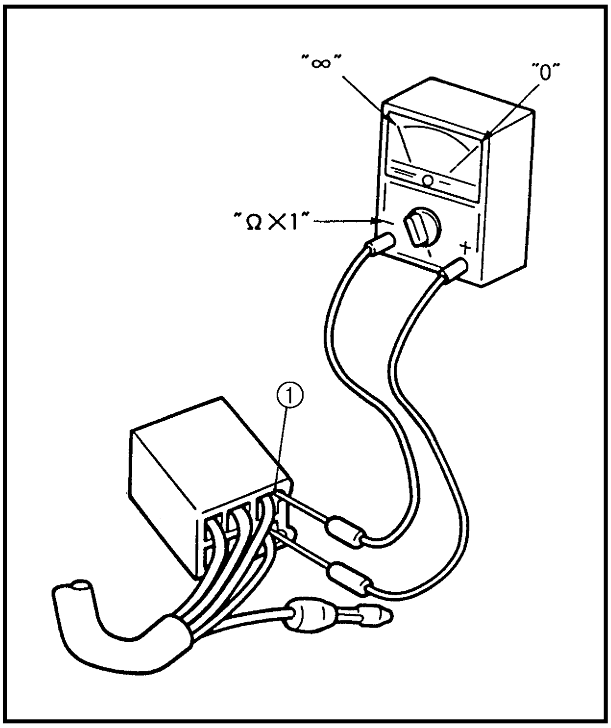
NOTE:
After setting the clock, be sure to push the "SELECT" button before turning the main switch to "OFF", otherwise the clock will not be set.

EB801000

SWITCHES

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

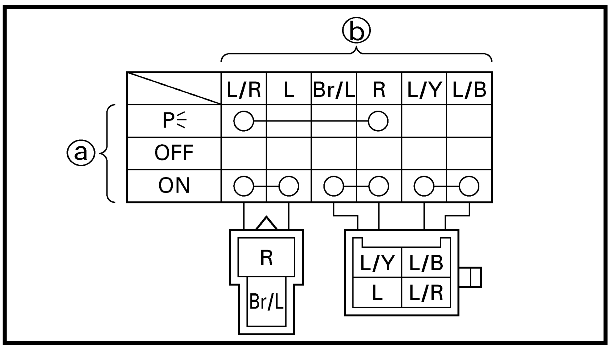


CAUTION:

Never insert the tester probes into the coupler terminal slots ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

Pocket tester
90890-03112

NOTE:
- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.



The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.

The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTE:
"○—○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

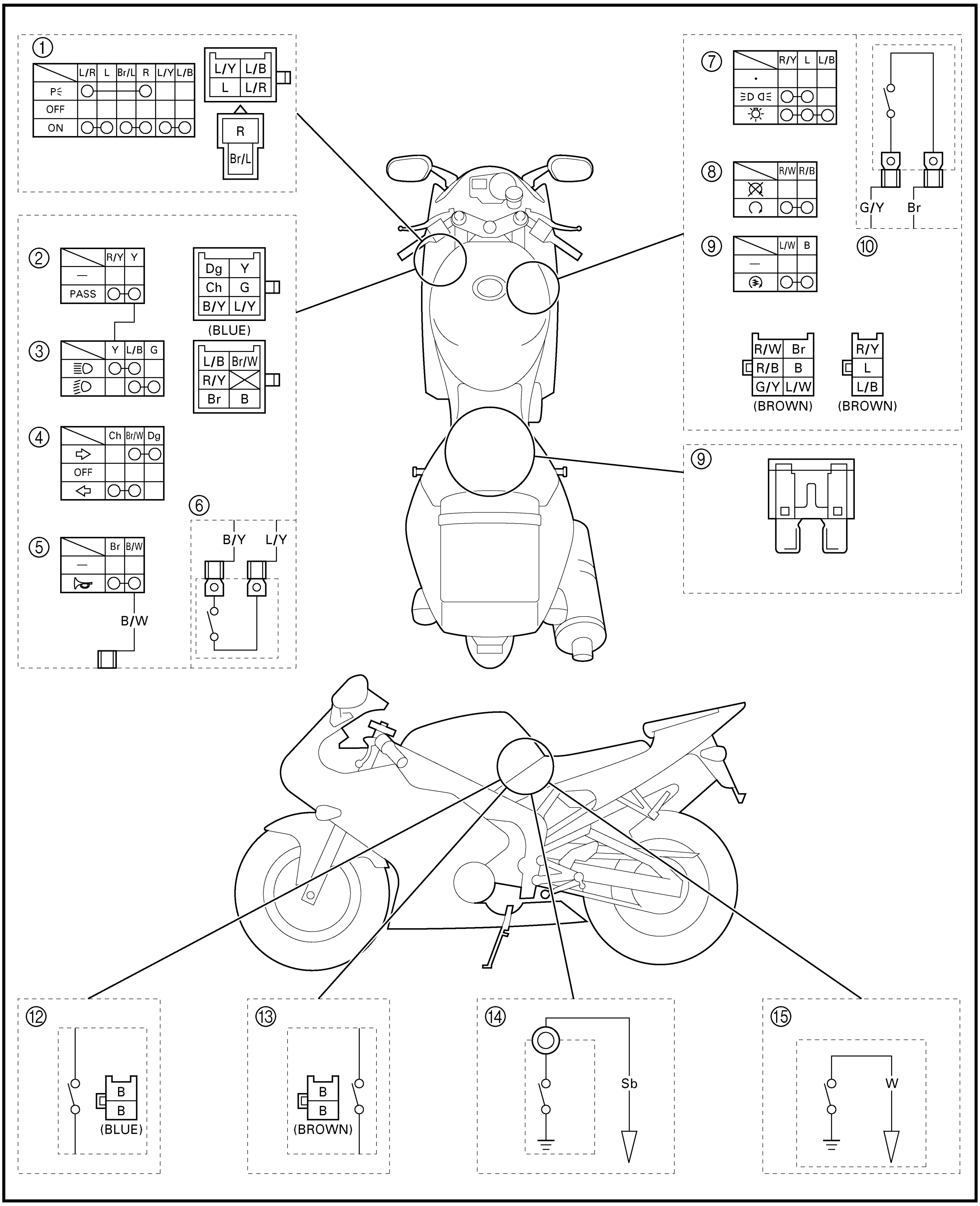
The example illustration on the left shows that:

There is continuity between blue/red and red when the switch is set to "P⋜".
There is continuity between blue/red and blue, between brown/blue and red, and between blue/yellow and blue/black when the switch is set to "ON".

EB801010
CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY”.

Damage/wear → Repair or replace the switch.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.


①
L/R L Br/L R L/Y L/B
P
OFF
ON
L/Y L/B
L L/R
R
Br/L
②
R/Y Y
PASS
Dg Y
Ch G
B/Y L/Y
(BLUE)
③
Y L/B G
L/B Br/W
R/Y
Br B
④
Ch Br/W Dg
OFF
⑤
Br B/W
B/W
⑥
B/Y L/Y
⑦
R/Y L L/B
⑧
R/W R/B
⑨
L/W B
⑩
G/Y Br
R/W Br
R/B B
G/Y L/W
(BROWN)
R/Y
L
L/B
(BROWN)
⑨
⑫
B
B
(BLUE)
⑬
B
B
(BROWN)
⑭
Sb
⑮
W

- ① Main switch
- ② Pass switch
- ③ Dimmer switch
- ④ Turn signal switch
- ⑤ Horn switch
- ⑥ Clutch switch
- ⑦ Light switch
- ⑧ Engine stop switch
- ⑨ Start switch
- ⑩ Front brake light switch
- ⑪ Fuse
- ⑫ Sidestand switch
- ⑬ Rear brake light switch
- ⑭ Neutral switch
- ⑮ Oil level switch

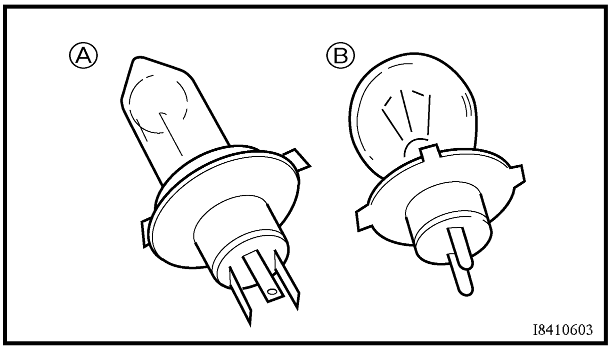
EB801020
CHECKING THE BULBS AND BULB SOCKETS

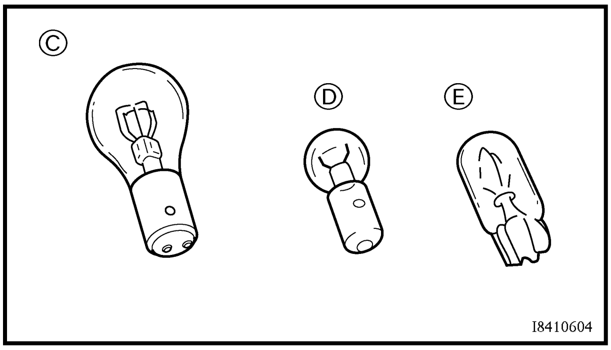
Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

Damage/wear → Repair or replace the bulb, bulb socket or both.

Improperly connected → Properly connect.

Incorrect continuity reading → Repair or replace the bulb, bulb socket or both.





TYPES OF BULBS

The bulbs used on this motorcycle are shown in the illustration on the left.

- Bulbs Ⓐ and Ⓑ are used for headlights and usually use a bulb holder which must be detached before removing the bulb. The majority of these bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulb Ⓒ is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs Ⓓ and Ⓔ are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

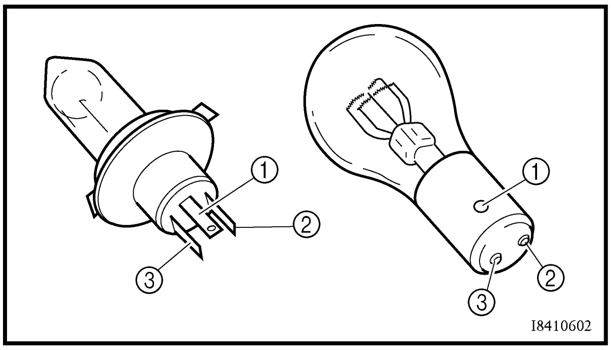
1. Remove:
   - bulb

⚠ WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

CAUTION:

- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.**



2. Check:
   - bulb (for continuity)
     (with the pocket tester)
     No continuity → Replace.

	Pocket tester **90890-03112**

NOTE:

Before checking for continuity, set the pocket tester to “0” and to the “Ω × 1” range.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the tester positive probe to terminal ① and the tester negative probe to terminal ②, and check the continuity.

b. Connect the tester positive probe to terminal ① and the tester negative probe to terminal ③, and check the continuity.

c. If either of the readings indicate no continuity, replace the bulb.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

1. Check:
   - bulb socket (for continuity) (with the pocket tester)

     No continuity → Replace.

	Pocket tester **90890-03112**

NOTE:

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Install a good bulb into the bulb socket.

b. Connect the pocket tester probes to the respective leads of the bulb socket.

c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

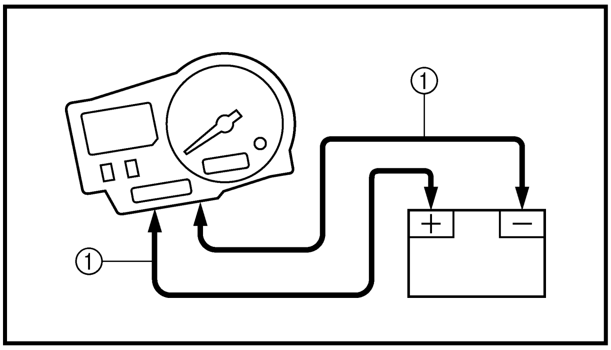
CHECKING THE LEDs

The following procedure applies to all of the LEDs.

1. Check:

   LED (for proper operation)

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼



a. Disconnect the meter assembly coupler (meter assembly side).

b. Connect two jumper leads ① from the battery terminals to the respective coupler terminals as shown.

⚠ WARNING

- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore make sure that no flammable gas or fluid is in the vicinity.**

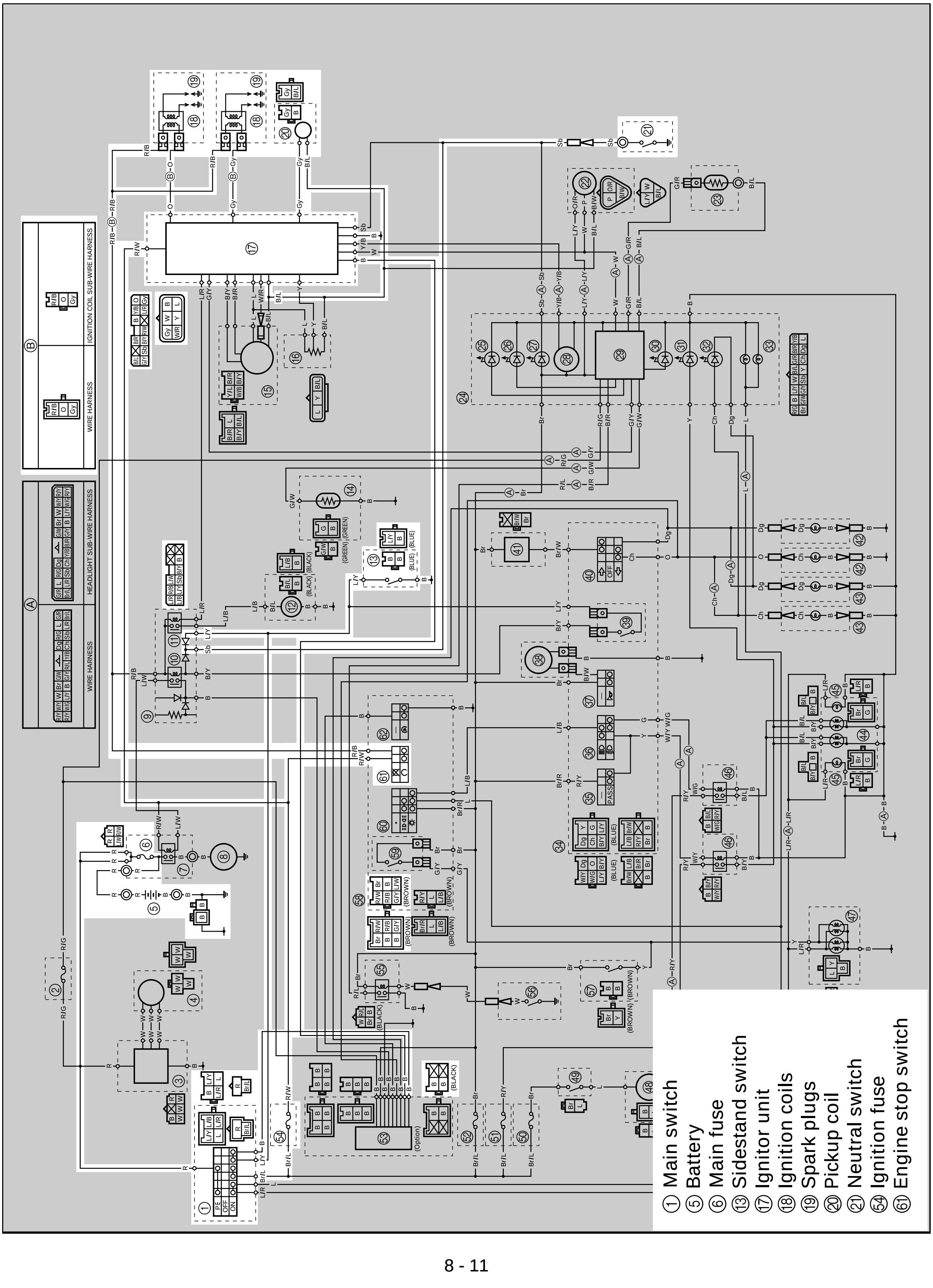
c. When the jumper leads are connected to the terminals the respective LED should illuminate.

Does not light → Replace the meter assembly.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EB802001
IGNITION SYSTEM

CIRCUIT DIAGRAM


A
B
WIRE HARNESS
HEADLIGHT SUB-WIRE HARNESS
IGNITION COIL SUB-WIRE HARNESS
(BLACK)
(BLUE)
(GREEN)
(BROWN)
(Option)
OFF
ON
PASS

- ① Main switch
- ⑤ Battery
- ⑥ Main fuse
- ⑬ Sidestand switch
- ⑰ Ignitor unit
- ⑱ Ignition coils
- ⑲ Spark plugs
- ⑳ Pickup coil
- ㉑ Neutral switch
- (54) Ignition fuse
- (61) Engine stop switch

EB802011

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:

1. main and ignition fuses
2. battery
3. spark plugs
4. ignition spark gap
5. spark plug cap resistance
6. ignition coil resistance
7. pickup coil resistance
8. main switch
9. engine stop switch
10. neutral switch
11. sidestand switch
12. relay unit
13. wiring
(of the entire ignition system)

NOTE:

- Before troubleshooting, remove the following part(-s):
  1) rider seat
  2) fuel tank
  3) air filter case
  4) ignition coil plate and ignition coils
  5) front cowling inner panel (left)
  6) windshield
- Troubleshoot with the following special tool(-s).

Ignition checker
90890-06754
Pocket tester
90890-03112

EB802400

1.Main and ignition fuses

- Check the main and ignition fuses for continuity.
Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and ignition fuses OK?

YES ⇩ NO ⬇

Replace the fuse(-s).

EB802401

2.Battery

- Check the condition of the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Min. open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ⇩ NO ⬇

- Clean the battery terminals.
- Recharge or replace the battery.

EB802403

3.Spark plugs

The following procedure applies to all of the spark plugs.

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap.
Refer to "CHECKING THE SPARK PLUGS" in chapter 3.

Standard spark plug
CR9E (NGK)
U27ESR-N (DENSO)
Spark plug gap
0.7 ~ 0.8 mm

- Is the spark plug in good condition, is it of the correct type, and its gap within specification?

YES ⇩ NO ⬇

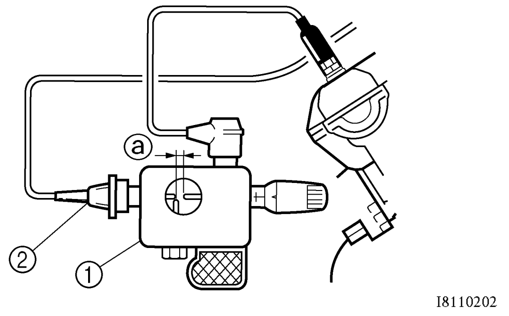
Re-gap or replace the spark plug.

EB802405

4.Ignition spark gap

The following procedure applies to all of the spark plugs.

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.
- ②Spark plug cap
- Set the main switch to “ON”.
- Measure the ignition spark gap ⓐ.
- Crank the engine by pushing the start switch and gradually increase the spark gap until a misfire occurs.



Min. ignition spark gap
6 mm

- Is there a spark and is the spark gap within specification?

NO ↓ YES ↓

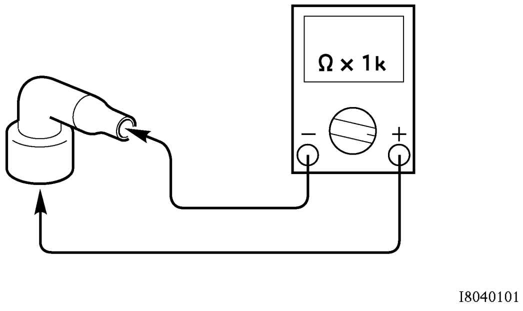
The ignition system is OK.

EB802407

5.Spark plug cap resistance

The following procedure applies to all of the spark plug caps.

- Disconnect the spark plug cap from the spark plug.
- Connect the pocket tester (Ω × 1k) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



Spark plug cap resistance
10 kΩ at 20 °C

- Is the spark plug cap OK?

YES ↓ NO ↓

Replace the spark plug cap.

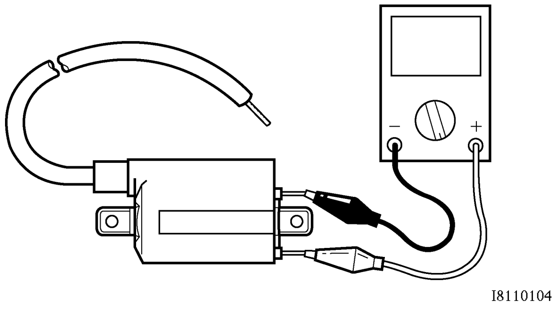
EB802409

6.Ignition coil resistance

The following procedure applies to all of the ignition coils.

- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Tester positive probe → red/black
Tester negative probe → orange (gray)

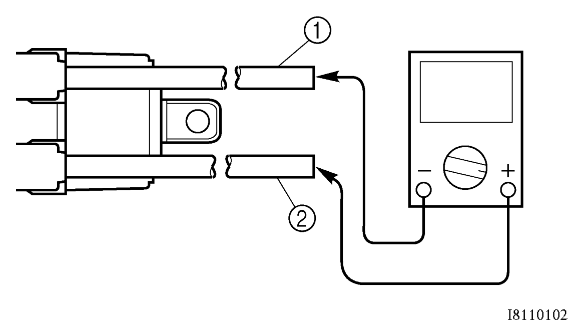


- Measure the primary coil resistance.

Primary coil resistance
1.87 ~ 2.53 Ω at 20 °C

- Connect the pocket tester (Ω × 1k) to the ignition coil as shown.
- Measure the secondary coil resistance.

Tester positive probe →
spark plug lead ①
Tester positive probe →
spark plug lead ②



Secondary coil resistance
12 ~ 18 kΩ at 20 °C

- Is the ignition coil OK?

YES NO

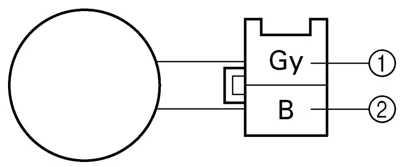
Replace the ignition coil.

EB802410

7.Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester (Ω × 100) to the pickup coil terminal.

Tester positive probe → gray ①
Tester negative probe → black ②



- Measure the pickup coil resistance.

Pickup coil resistance
248 ~ 372 Ω at 20 °C
(between gray and black)

- Is the pickup coil OK?

YES NO

Replace the pickup coil.

EB802411

8.Main switch

- Check the main switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES NO

Replace the main switch.

EB802412

9.Engine stop switch

- Check the engine stop switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the engine stop switch OK?

YES NO

Replace the right handlebar switch.

EB802413

10.Neutral switch

- Check the neutral switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the neutral switch OK?

YES NO

Replace the neutral switch.

EB802414

11.Sidestand switch

- Check the sidestand switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the sidestand switch OK?

YES NO

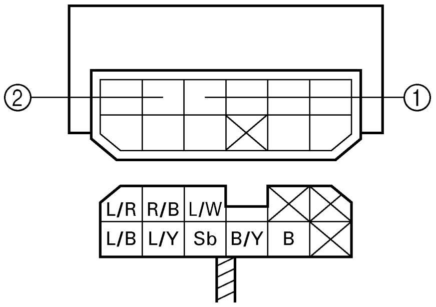
Replace the sidestand switch.

EB802415

12.Relay unit

- Remove the relay unit from the wire harness.
- Connect the pocket tester (Ω × 1) to the relay unit terminals as shown.
- Check the starting circuit cutoff relay for continuity.

Tester positive probe → sky blue ① **Tester negative probe → blue/yellow ②**	**Continuity**
Tester positive probe → blue/yellow ② **Tester negative probe → sky blue ①**	**No continuity**



NOTE:
When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES

NO

Replace the relay unit.

EB802416

13.Wiring

- Check the entire ignition system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

NO

YES

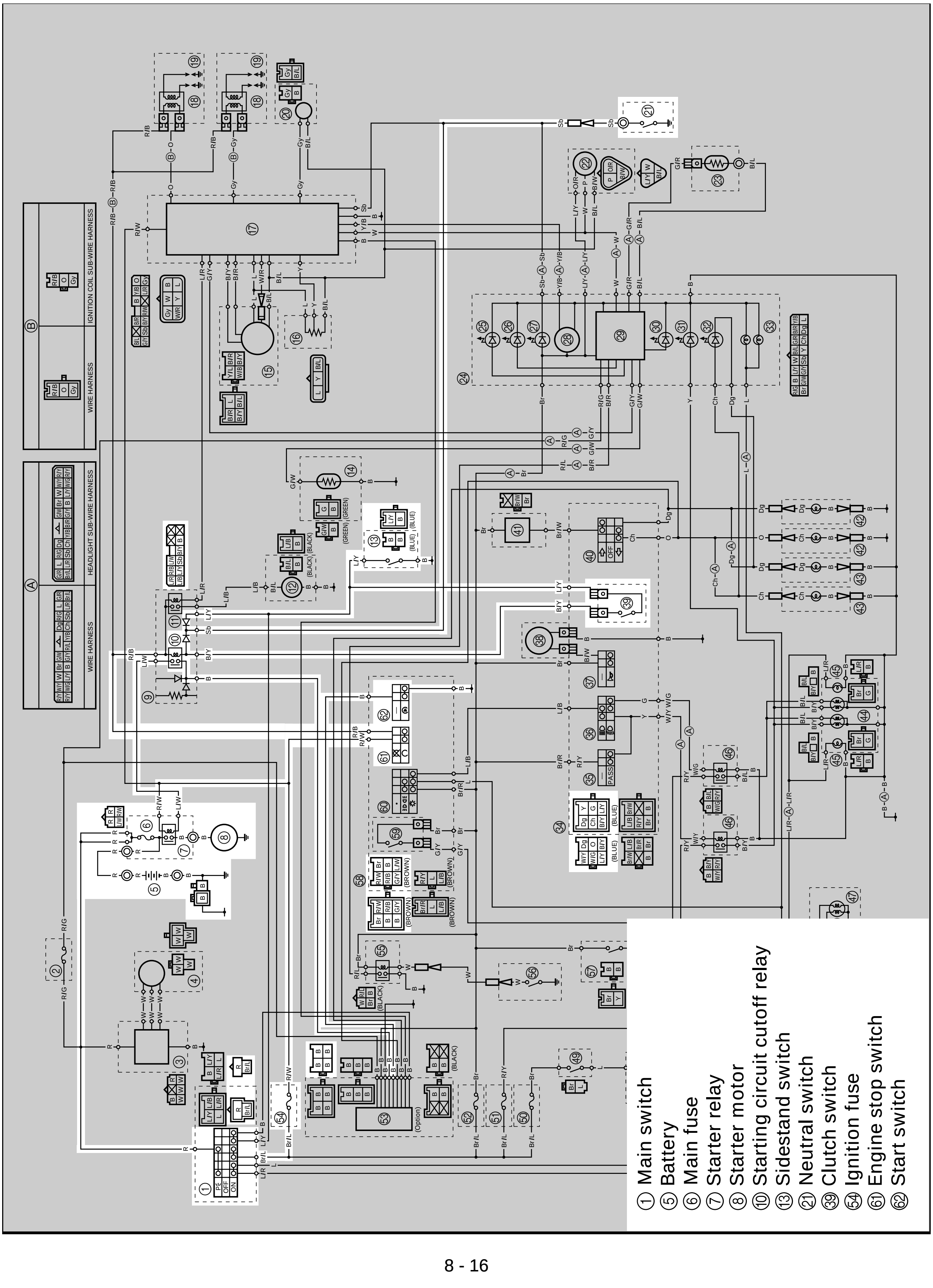
Properly connect or repair the ignition system's wiring.

Replace the ignitor unit.

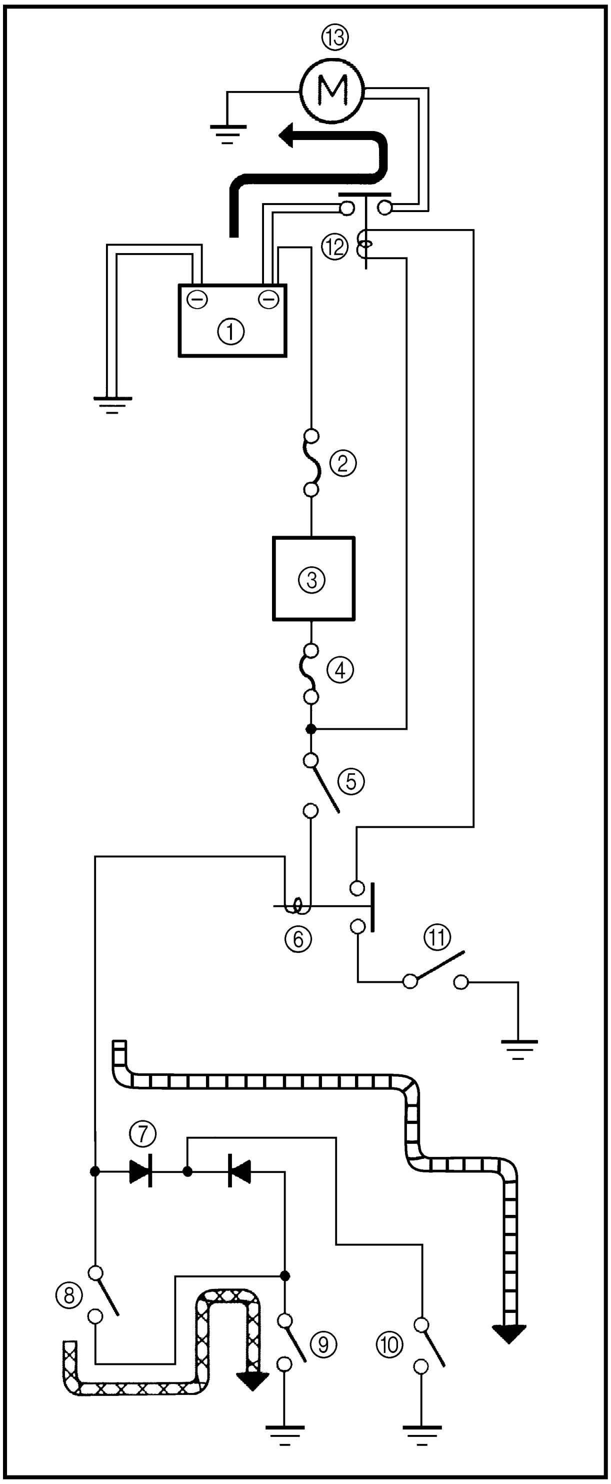
EB803000

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM



① Main switch
⑤ Battery
⑥ Main fuse
⑦ Starter relay
⑧ Starter motor
⑩ Starting circuit cutoff relay
⑬ Sidestand switch
㉑ Neutral switch
㊴ Clutch switch
(54) Ignition fuse
(61) Engine stop switch
(62) Start switch



EB803010

STARTING CIRCUIT CUTOFF SYSTEM OPERATION

If the engine stop switch is set to “↻ ” and the main switch is set to “ON” (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

- The transmission is in neutral (the neutral switch is closed).
- The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cutoff relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cutoff relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cutoff relay is closed and the engine can be started by pressing the start switch.

◀□□□ WHEN THE TRANSMISSION IS IN NEUTRAL

◀××× WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR

① Battery
② Main fuse
③ Main switch
④ Ignition fuse
⑤ Engine stop switch
⑥ Starting circuit cutoff relay
⑦ Diode
⑧ Clutch switch
⑨ Sidestand switch
⑩ Neutral switch
⑪ Start switch
⑫ Starter relay
⑬ Starter motor

EB803020

TROUBLESHOOTING

The starter motor fails to turn.

Check:

1. main and ignition fuses
2. battery
3. starter motor
4. starting circuit cutoff relay
5. relay unit
6. starter relay
7. main switch
8. engine stop switch
9. neutral switch
10. sidestand switch
11. clutch switch
12. start switch
13. wiring
    (of the entire starting system)

NOTE:

- Before troubleshooting, remove the following part(-s):

1) rider seat
2) fuel tank
3) air filter case
4) front cowling inner panel (left)
5) windshield

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EB802400

1.Main and ignition fuses

- Check the main and ignition fuses for continuity.
  Refer to “CHECKING THE FUSES” in chapter 3.
- Are the main and ignition fuses OK?

YES ⇩ NO ⬇

Replace the fuse(-s).

EB802401

2.Battery

- Check the condition of the battery.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

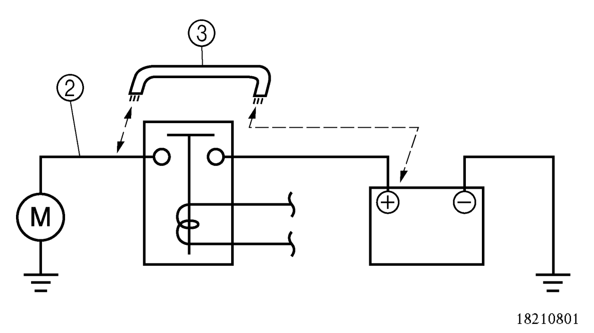
YES ⇩ NO ⬇

- Clean the battery terminals.
- Recharge or replace the battery.

EB803400

3.Starter motor

- Connect the battery positive terminal ① and starter motor lead ② with a jumper lead ③.



⚠ WARNING

- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore make sure that no flammable gas or fluid is in the vicinity.**

- Does the starter motor turn?

YES ⇩ NO ⬇

Repair or replace the starter motor.

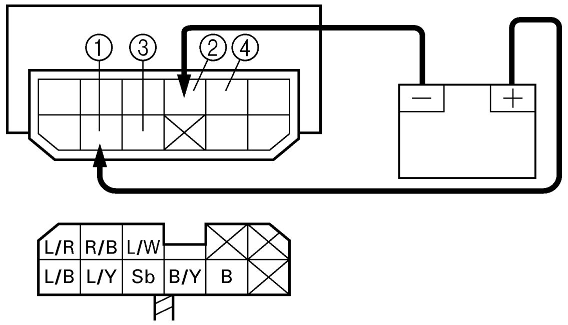
EB803402

4.Starting circuit cutoff relay

- Disconnect the relay unit from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the relay unit terminals as shown.

Battery positive terminal → red/black ①
Battery negative terminal → black/yellow ②

Tester positive probe → blue/white ③
Tester negative probe → black ④



- Does the starting circuit cutoff relay have continuity between black and blue/white?

YES

NO

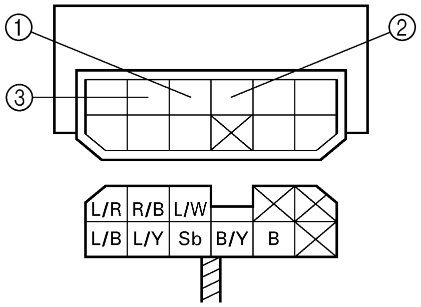
Replace the relay unit.

EB803403

5.Relay unit

- Disconnect the relay unit from the coupler.
- Connect the pocket tester (Ω × 1) to the relay unit terminals as shown.
- Measure the starting circuit cutoff relay for continuity as follows.

Tester positive probe → sky blue ① **Tester negative probe → black/yellow ②**	**Continuity**
Tester positive probe → sky blue ① **Tester negative probe → blue/yellow ③**	
Tester positive probe → black/yellow ② **Tester negative probe → sky blue ①**	**No continuity**
Tester positive probe → blue/yellow ③ **Tester negative probe → sky blue ①**	



NOTE:
When you switch the tester's positive and negative probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES

NO

Replace the relay unit.

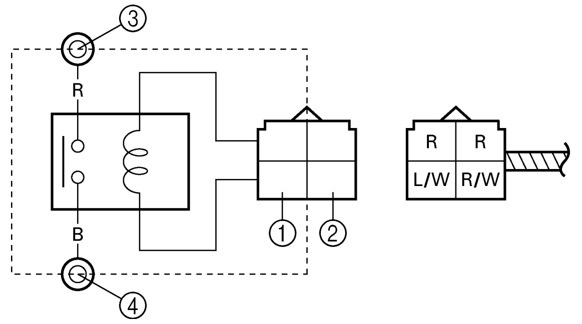
EB803404

6.Starter relay

- Disconnect the starter relay from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starter relay coupler as shown.

Battery positive terminal → red/white ①
Battery negative terminal → blue/white ②

Tester positive probe → red ③
Tester negative probe → black ④



- Does the starter relay have continuity between red and black?

YES

NO

Replace the starter relay.

EB802411

7.Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES

NO

Replace the main switch.

EB802412

8.Engine stop switch

- Check the engine stop switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the engine stop switch OK?

YES

NO

Replace the right handlebar switch.

EB802413

9.Neutral switch

- Check the neutral switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the neutral switch OK?

YES

NO

Replace the neutral switch.

EB802414

10.Sidestand switch

- Check the sidestand switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the sidestand switch OK?

YES

NO

Replace the sidestand switch.

EB803405

11.Clutch switch

- Check the clutch switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the clutch switch OK?

YES

NO

Replace the clutch switch.

EB803406

12.Start switch

- Check the start switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the start switch OK?

YES

NO

Replace the right handlebar switch.

EB803408

13.Wiring

- Check the entire starting system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the starting system’s wiring properly connected and without defects?

NO

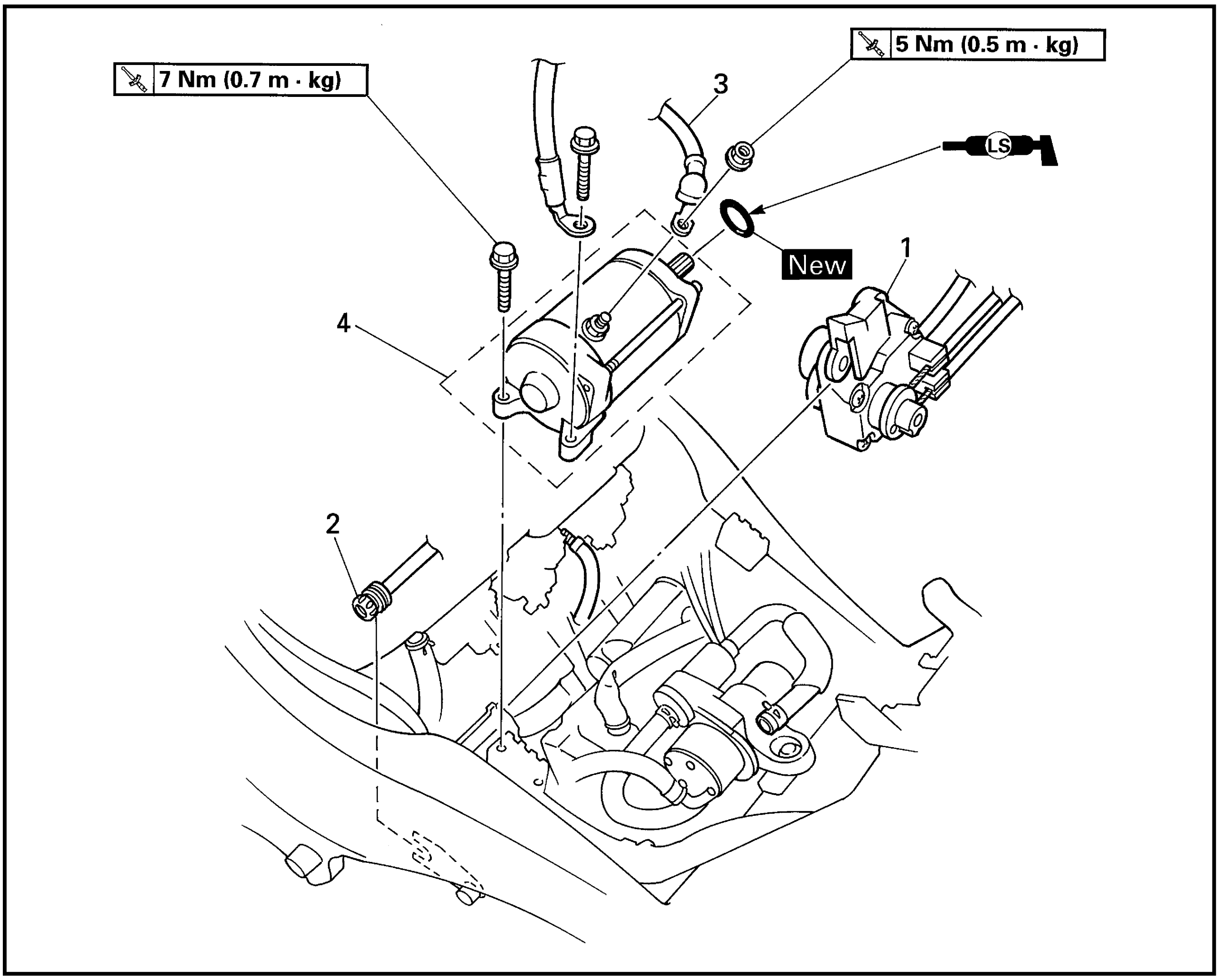
YES

Properly connect or repair the starting system’s wiring.

The starting system circuit is OK.

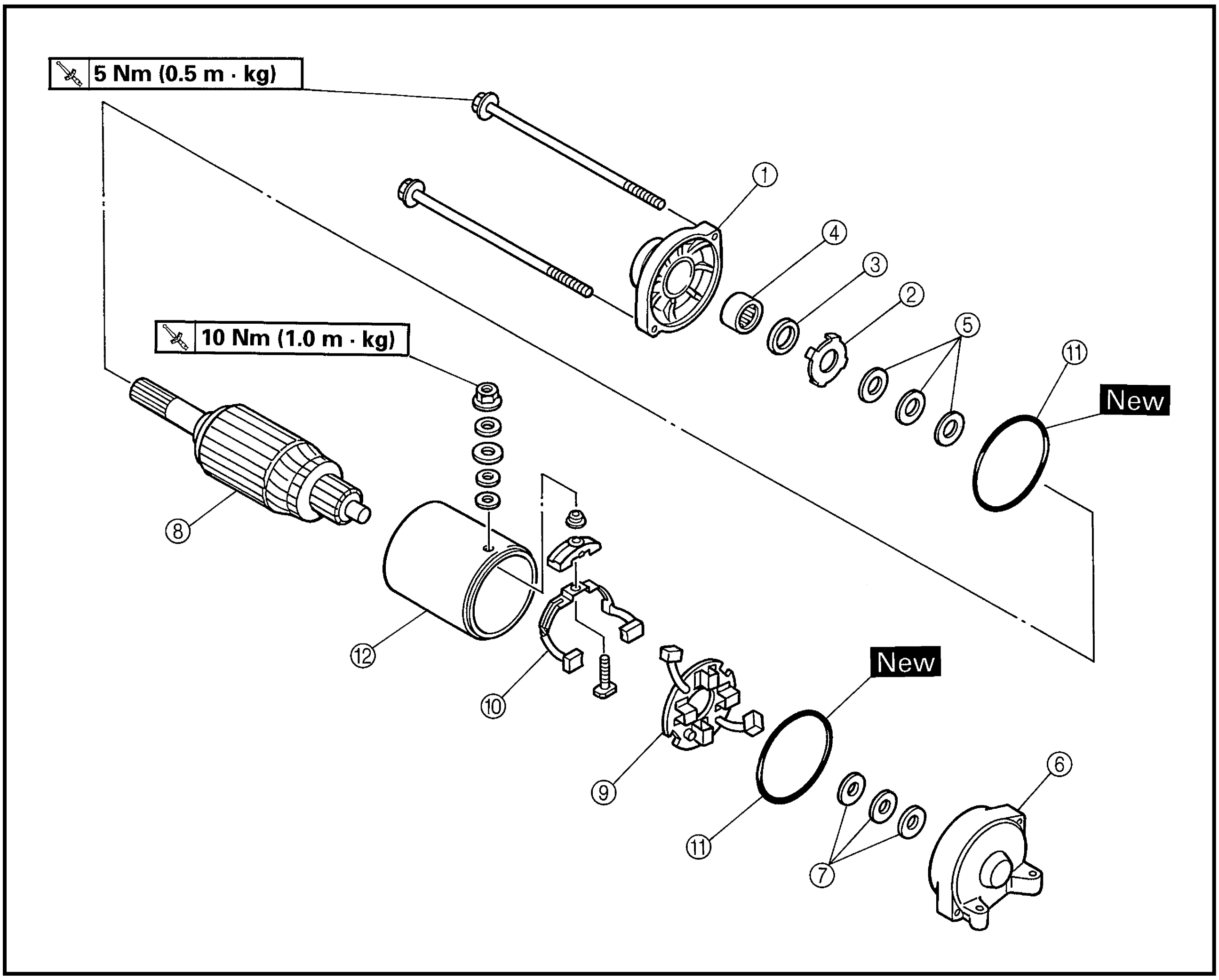
EB803500

STARTER MOTOR



Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
	Rider seat		Refer to "SEATS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Left side cowling		Refer to "COWLINGS" in chapter 3.
1	EXUP servomotor	1	
2	Throttle stop screw	1	
3	Starter motor lead	1	
4	Starter motor assembly	1	
			For installation, reverse the removal procedure.

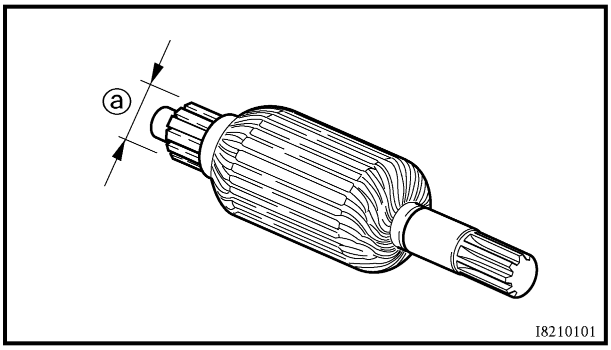
EB803501



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Remove the parts in the order listed.
①	Starter motor front cover	1	
②	Lock washer	1	
③	Oil seal	1	
④	Bearing	1	
⑤	Washer set	1	
⑥	Starter motor rear cover	1	
⑦	Washer set	1	
⑧	Armature assembly	1	
⑨	Brush seat (along with the brushes)	1	
⑩	Brush holder (along with the brushes)	1	
⑪	O-ring	2	
⑫	Starter motor yoke	1	
			For assembly, reverse the disassembly procedure

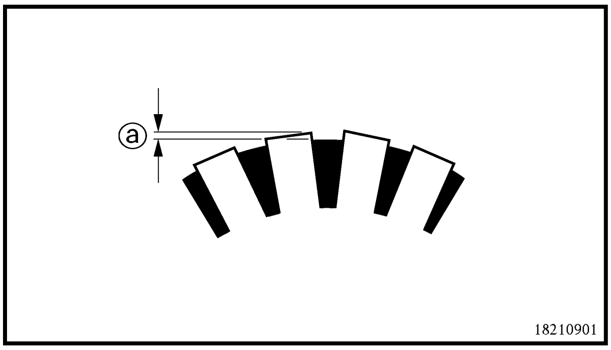
EB803511

CHECKING THE STARTER MOTOR



1. Check:
   - commutator
     Dirt → Clean with 600 grit sandpaper.
2. Measure:
   - commutator diameter ⓐ
     Out of specification → Replace the starter motor.

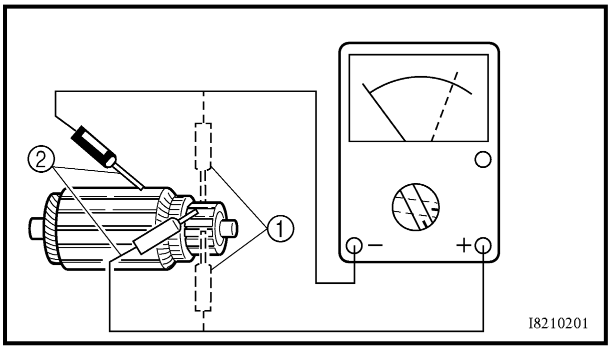
Min. commutator diameter
27 mm



3. Measure:
   - mica undercut ⓐ
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade which has been grounded to fit the commutator.

Mica undercut
0.7 mm

NOTE:
The mica must be undercut to ensure proper operation of the commutator.



4. Measure:
   - armature assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

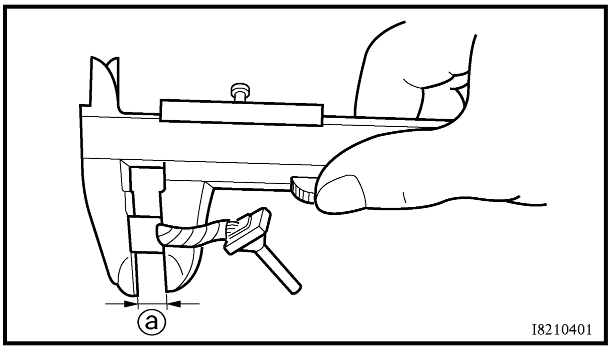
a. Measure the armature assembly resistances with the pocket tester.

Pocket tester
90890-03112

Armature assembly
Commutator resistance ①
0.025 ~ 0.035 Ω at 20 °C
Insulation resistance ②
Above 1 MΩ at 20 °C

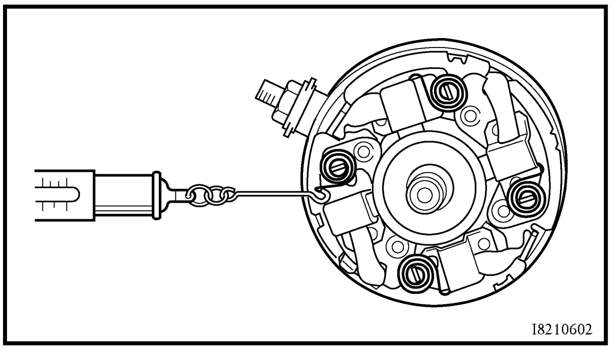
b. If any resistance is out of specification, replace the starter motor.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



5. Measure:
   - brush length ⓐ
     Out of specification → Replace the brushes as a set.

Min. brush length
5 mm



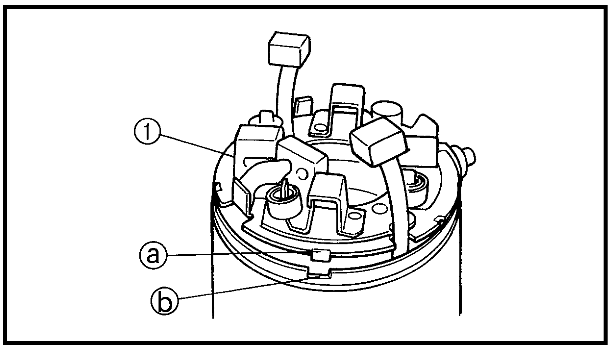
6. Measure:
   - brush spring force
     Out of specification → Replace the brush springs as a set.

Brush spring force
7.03 ~ 10.63 N (717 ~ 1,084 gf)

7. Check:
   - gear teeth
     Damage/wear → Replace the gear.
8. Check:
   - bearing
   - oil seal
     Damage/wear → Replace the defective part(-s).

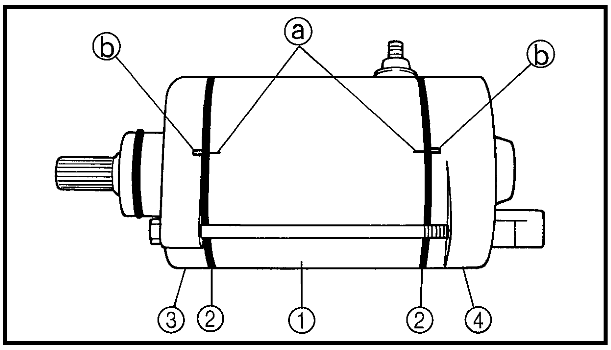
EB803701

ASSEMBLING THE STARTER MOTOR



1. Install:
   - brush seat ①

NOTE:
Align the tab ⓐ on the brush seat with the slot ⓑ in the starter motor rear cover.



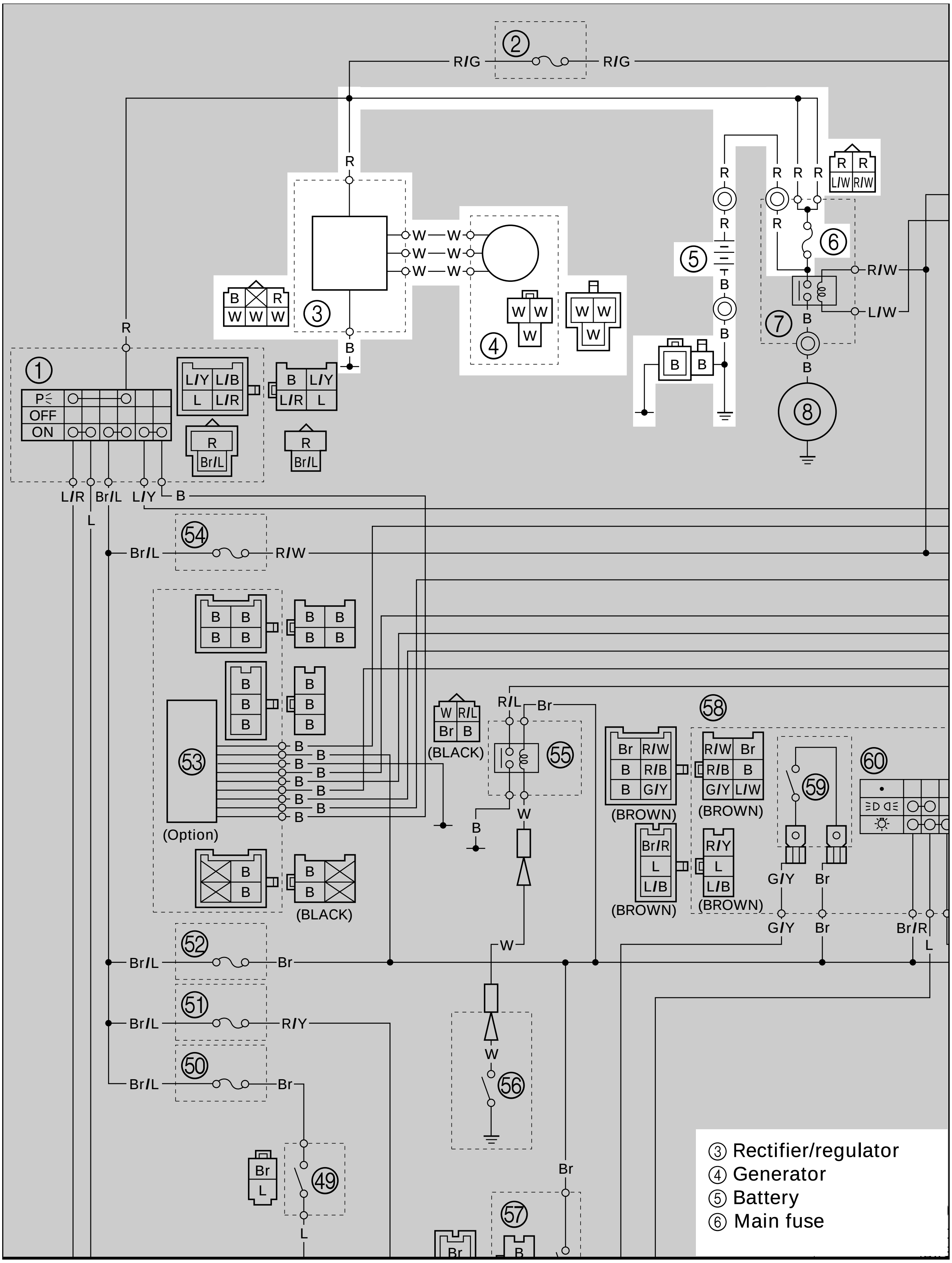
2. Install:
   - starter motor yoke ①
   - O-rings ② New
   - starter motor front cover ③
   - starter motor rear cover ④
   - bolts **5 Nm (0.5 m · kg)**

NOTE:
Align the match marks ⓐ on the starter motor yoke with the match marks ⓑ on the front and rear covers.

EB804000

CHARGING SYSTEM

CIRCUIT DIAGRAM


①
②
③
④
⑤
⑥
⑦
⑧
㊾
㊿
(51)
(52)
(53)
(54)
(55)
(56)
(57)
(58)
(59)
(60)
R/G
R
R/W
L/W
W
B
Br
Br/L
L/R
L/Y
L/B
L
R/Y
R/L
R/B
G/Y
Br/R
P
OFF
ON
(Option)
(BLACK)
(BROWN)

③ Rectifier/regulator
④ Generator
⑤ Battery
⑥ Main fuse

EB804010

TROUBLESHOOTING

The battery is not being charged.

Check:

1. main fuse
2. battery
3. charging voltage
4. stator coil assembly resistance
5. wiring
   (of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(-s):
  1) rider seat
  2) fuel tank
- Troubleshoot with the following special tool(-s).

Engine tachometer
90890-03113
Pocket tester
90890-03112

EB802400

1.Main fuse

- Check the main fuse for continuity.
  Refer to “CHECKING THE FUSES” in chapter 3.
- Is the main fuse OK?

YES ⇩ NO ⬇

Replace the fuse.

EB802401

2.Battery

- Check the condition of the battery.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ⇩ NO ⬇

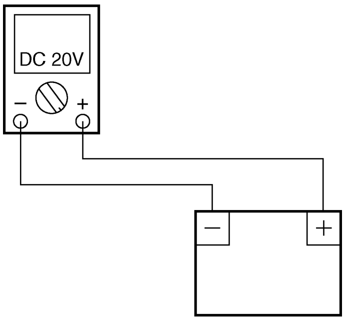
- Clean the battery terminals.
- Recharge or replace the battery.

EB804400

3.Charging voltage

- Connect the engine tachometer to the spark plug lead of cylinder #1.
- Connect the pocket tester (DC 20V) to the battery as shown.

Tester positive probe →
battery positive terminal
Tester negative probe →
battery negative terminal



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.

Charging voltage
14 V at 5,000 r/min

NOTE:
Make sure that the battery is fully charged.

- Is the charging voltage within specification?

⬇ NO ⇩ YES

The charging circuit is OK.

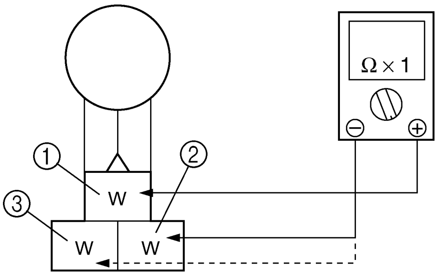
EB804401

4.Stator coil assembly resistances

- Remove the generator cover.
- Connect the pocket tester (Ω × 1) to the stator coil assembly coupler as shown.

Tester positive probe → white ①
Tester negative probe → white ②

Tester positive probe → white ①
Tester negative probe → white ③



- Measure the stator coil assembly resistances.

Stator coil resistance
0.45 ~ 0.55 Ω at 20 °C

- Is the stator coil assembly OK?

⇩ YES ⬇ NO

Replace the stator coil assembly.

EB804404

5.Wiring

- Check the wiring connections of the entire charging system.
  Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

⬇ NO ⇩ YES

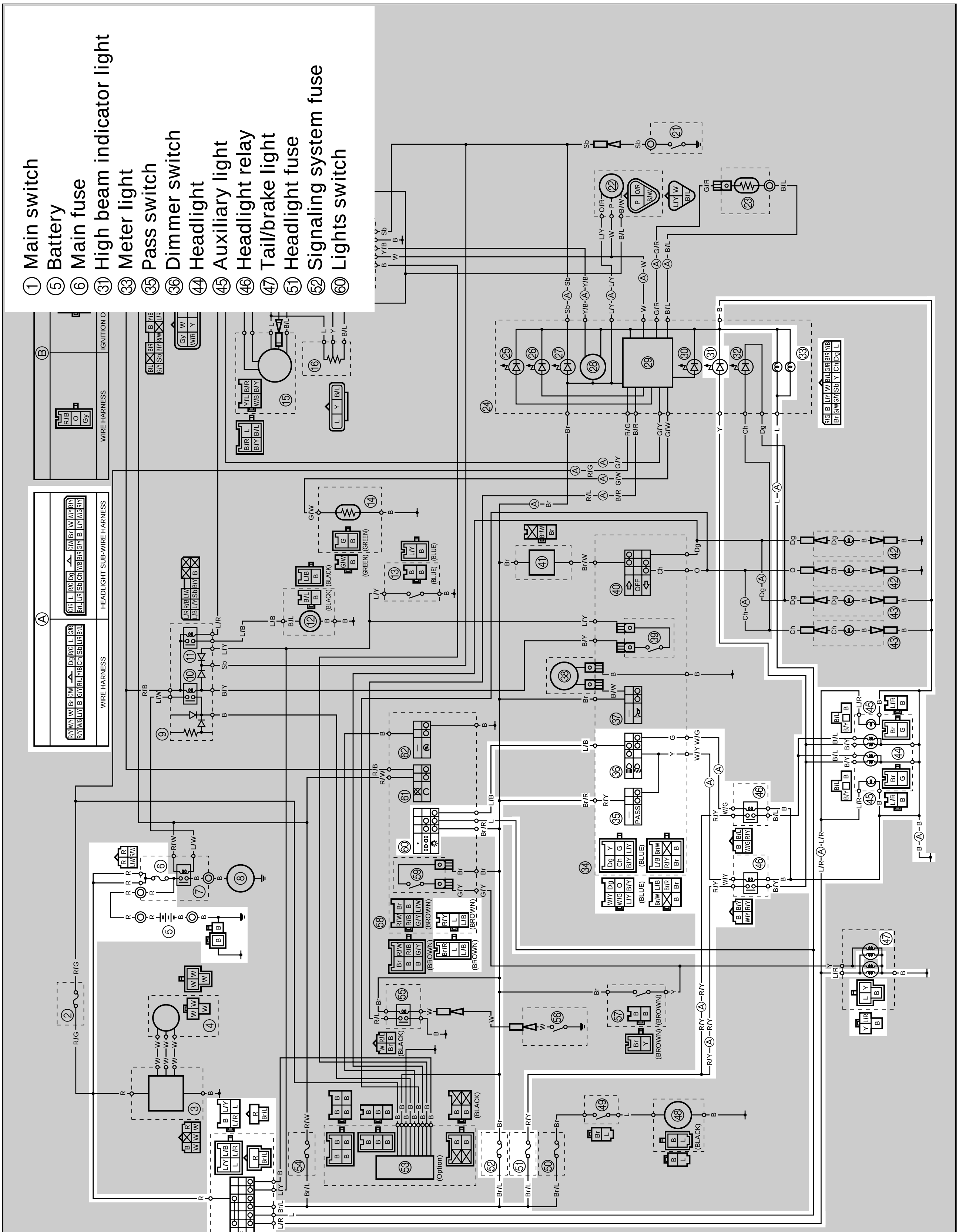
Properly connect or repair the charging system's wiring.

Replace the rectifier/regulator.

EB805000

LIGHTING SYSTEM

CIRCUIT DIAGRAM


A
B
WIRE HARNESS
HEADLIGHT SUB-WIRE HARNESS
IGNITION C
(BLACK)
(BLUE)
(GREEN)
(BROWN)
(Option)
PASS
OFF
ON

① Main switch
⑤ Battery
⑥ Main fuse
㉛ High beam indicator light
㉝ Meter light
㉟ Pass switch
㊱ Dimmer switch
㊹ Headlight
㊺ Auxiliary light
㊻ Headlight relay
㊼ Tail/brake light
(51) Headlight fuse
(52) Signaling system fuse
(60) Lights switch

EB805010

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, auxiliary light or meter light.

Check:

1. main, signaling system, and headlight fuses
2. battery
3. main switch
4. lights switch
5. dimmer switch
6. pass switch
7. wiring
   (of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(-s):
  1) seats
  2) fuel tank
  3) air filter case
  4) front cowling inner panels
  5) front cowling
  6) rear cowling
- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EB802400

1.Main, signaling system, and headlight fuses

- Check the main, signaling system, and headlight fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, signaling system, and headlight fuses OK?

⇩ YES ⬇ NO

Replace the fuse(-s).

EB802401

2.Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

⇩ YES ⬇ NO

- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

⇩ YES ⬇ NO

Replace the main switch.

EB805400

4.Lights switch

- Check the lights switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the lights switch OK?

⇩ YES ⬇ NO

The lights switch is faulty. Replace the right handlebar switch.

EB805401

5.Dimmer switch

- Check the dimmer switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the dimmer switch OK?

YES ⇩ NO ⬇

The dimmer switch is faulty. Replace the left handlebar switch.

EB805403

6.Pass switch

- Check the pass switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the pass switch OK?

YES ⇩ NO ⬇

The pass switch is faulty. Replace the left handlebar switch.

EB805404

7.Wiring

- Check the entire lighting system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the lighting system’s wiring properly connected and without defects?

YES ⇩ NO ⬇

Check the condition of each of the lighting system’s circuits.
Refer to “CHECKING THE LIGHTING SYSTEM”.

Properly connect or repair the lighting system’s wiring.

EB805410

CHECKING THE LIGHTING SYSTEM

1. The headlight and the high beam indicator light fail to come on.

1.Headlight bulb and socket

- Check the headlight bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the headlight bulb and socket OK?

YES ⇩ NO ⬇

Replace the headlight bulb, socket or both.

2.High beam indicator light LED

- Check the LED of the high beam indicator light.
  Refer to “CHECKING THE LEDs”.
- Is the high beam indicator light LED OK?

YES ⇩ NO ⬇

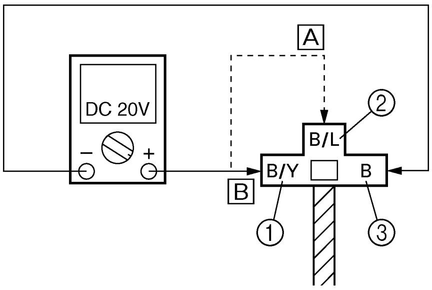
Replace the motor assembly.

3.Voltage

- Connect the pocket tester (DC 20V) to the headlight and high beam indicator light couplers as shown.

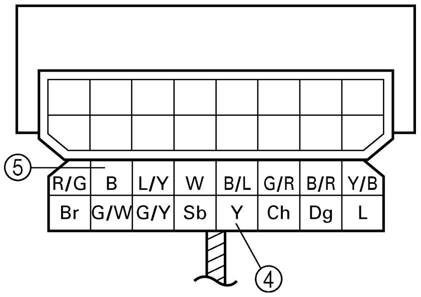
A When the dimmer switch is set to “≋D”
B When the dimmer switch is set to “≣D”

Headlight coupler (wire harness side)



Headlight
Tester positive probe →
black/yellow ① or black/blue ②
Tester negative probe → black ③
High beam indicator light
Tester positive probe → yellow ④
Tester negative probe → black ⑤

Meter assembly coupler (wire harness side)



- Set the main switch to “ON”.
- Set the light switch to “ ☼ ”.
- Set the dimmer switch to “≣D” or “≣D”.
- Measure the voltage (12 V) of black/yellow (black/blue) ② on the headlight coupler (headlight side).
- Is the voltage within specification?

YES

NO

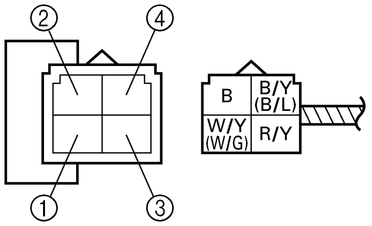
The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.

4.Headlight relay

- Disconnect the headlight relay from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the headlight relay terminals as shown.

Battery positive terminal →
red/yellow ①
Battery negative terminal →
black/yellow (black/blue) ②

Tester positive probe →
white/yellow (white/green) ③
Tester negative probe → black ④



- Does the headlight relay have continuity between white/yellow (white/green) and black?

YES

NO

This circuit is OK.

Replace the headlight relay.

EB805411

2. A meter light fails to come on.

1.Meter light bulb and socket

- Check the meter light bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the meter light bulb and socket OK?

YES

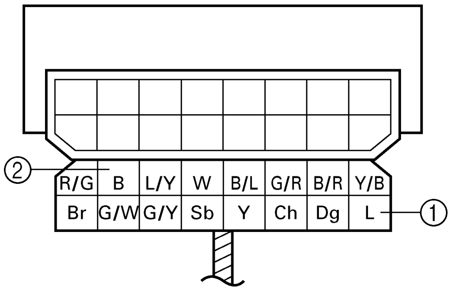
NO

Replace the meter light bulb, socket or both.

2.Voltage

- Connect the pocket tester (20 V) to the meter assembly coupler (wire harness side) as shown.

Tester positive probe → blue ①
Tester negative probe → black ②



- Set the main switch to "ON".
- Set the light switch to "≡D ᗡ≡" or " ☼ ".
- Measure the voltage (12 V) of blue ① on the meter assembly coupler (wire harness side).
- Is the voltage within specification?

YES ⇩ → This circuit is OK.

NO ⬇ → The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EB805412

3. A tail/brake light fails to come on.

1.Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the tail/brake light bulb and socket OK?

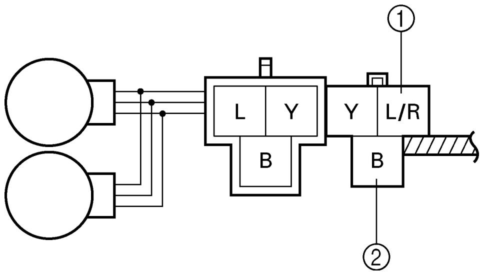
YES ⇩

NO ⬇ → Replace the tail/brake light bulb, socket or both.

2.Voltage

- Connect the pocket tester (DC 20V) to the tail/brake light coupler (wire harness side) as shown.

Tester positive probe → blue/red ①
Tester negative probe → black ②



- Set the main switch to "ON".
- Set the light switch to "≡D ᗡ≡" or " ☼ ".
- Measure the voltage (12 V) of blue/red ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

YES ⇩ → This circuit is OK.

NO ⬇ → The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EB805413

4. The auxiliary light fails to come on.

1.Auxiliary light bulb and socket

- Check the auxiliary light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the auxiliary light bulb and socket OK?

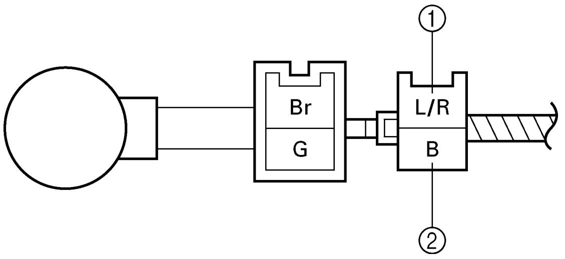
YES ⇩

NO ⬇ → Replace the auxiliary light bulb, socket or both.

2.Voltage

- Connect the pocket tester (DC 20V) to the auxiliary light couplers (wire harness side) as shown.

Tester positive probe → blue/red ①
Tester negative probe → black ②



- Set the main switch to “ON”.
- Set the light switch to “≡D ◁≡” or “☼”.
- Measure the voltage (12 V) of blue/red ① on the auxiliary light couplers (wire harness side).
- Is the voltage within specification?

YES ⇩

This circuit is OK.

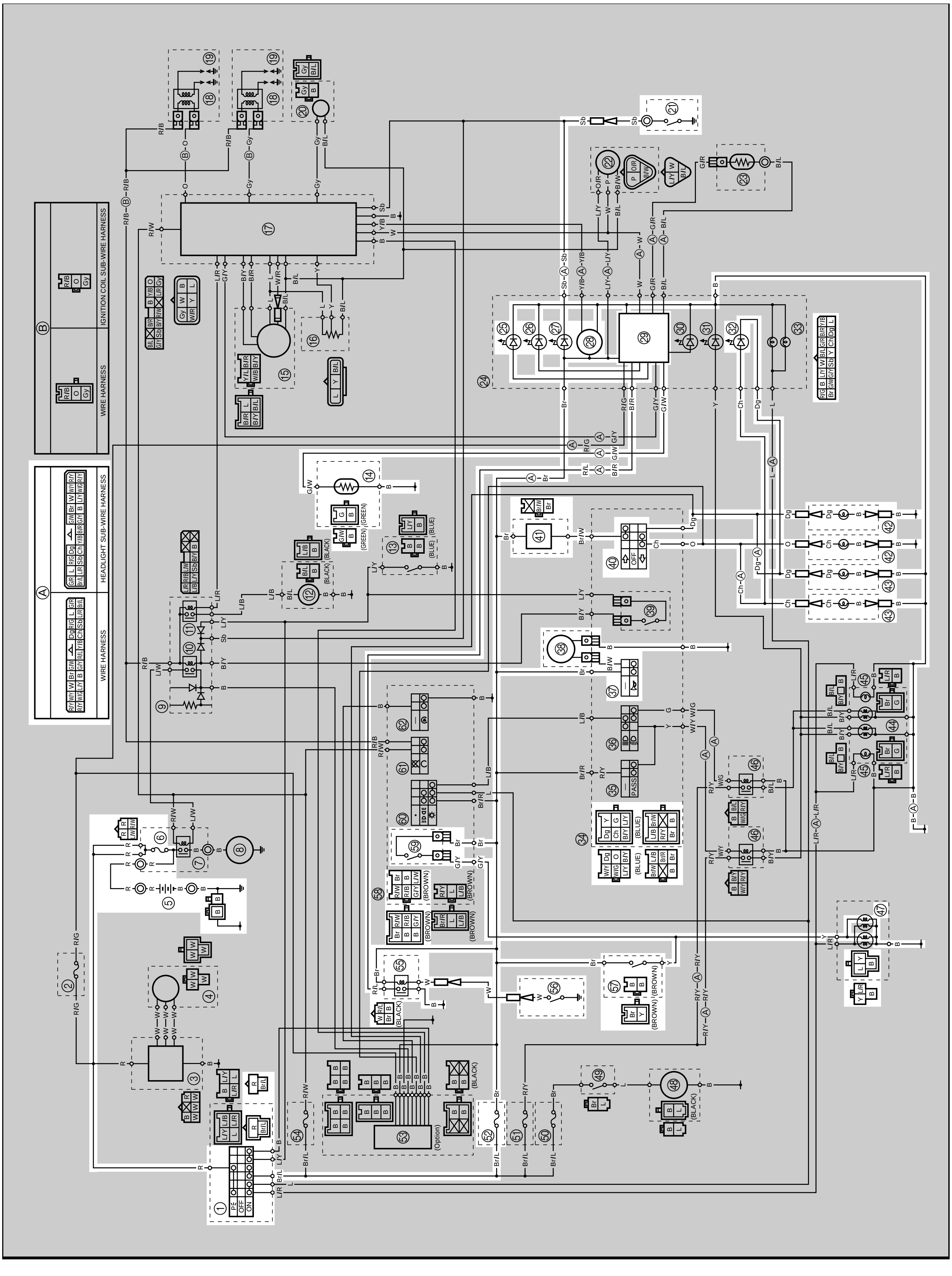
NO ⬇

The wiring circuit from the main switch to the auxiliary light connectors is faulty and must be repaired.

EB806000

SIGNALING SYSTEM

CIRCUIT DIAGRAM


A
B
WIRE HARNESS
IGNITION COIL SUB-WIRE HARNESS
HEADLIGHT SUB-WIRE HARNESS
(BLACK)
(GREEN)
(BLUE)
(BROWN)
(Option)
OFF
ON
PASS

① Main switch
⑤ Battery
⑥ Main fuse
⑭ Fuel sender
㉑ Neutral switch
㉕ Fuel level indicator light
㉖ Oil level/coolant temperature warning light
㉗ Neutral indicator light
㉘ Tachometer
㉙ Combination meter
㉜ Turn signal indicator light
㊲ Horn switch
㊳ Horn
㊵ Turn signal switch
㊶ Turn signal relay
㊷ Rear turn signal light
㊸ Front turn signal light
㊼ Tail/brake light
(52) Signaling system fuse
(55) Oil level relay
(56) Oil level switch
(57) Rear brake light switch
(59) Front brake light switch

EB806010
TROUBLESHOOTING

- **Any of the following fail to light: turn signal light, brake light or an indicator light.**
- **The horn fails to sound.**

Check:
1. main and signaling system fuses
2. battery
3. main switch
4. wiring
   (of the entire signaling system)

NOTE:
- Before troubleshooting, remove the following part(-s):
  1) seats
  2) fuel tank
  3) air filter case
  4) front cowling inner panels
  5) bottom cowling
  6) left side cowling
  7) windshield
  8) rear cowling
- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EB802400
1.Main and signaling system fuses

- Check the main and signaling system fuses for continuity.
  Refer to "CHECKING AND CHARGING THE FUSES" in chapter 3.
- Are the main and signaling system fuses OK?

YES ⇩ NO ⬇

Replace the fuse(-s).

EB802401
2.Battery

- Check the condition of the battery.
  Refer to "CHECKING THE BATTERY" in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ⇩ NO ⬇

- Clean the battery terminals.
- Recharge or replace the battery.

EB802411
3.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES ⇩ NO ⬇

Replace the main switch.

EB806400
4.Wiring

- Check the entire signaling system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?

YES ⇩ NO ⬇

Check the condition of each of the signaling system's circuits.
Refer to "CHECKING THE SIGNALING SYSTEM".

Properly connect or repair the signaling system's wiring.

EB806410

CHECKING THE SIGNALING SYSTEM

1. The horn fails to sound.

1.Horn switch

- Check the horn switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the horn switch OK?

YES

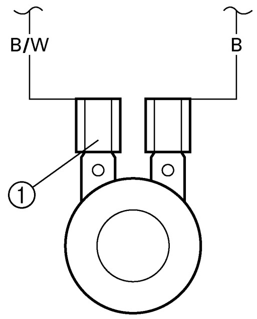
NO

Replace the left handlebar switch.

2.Voltage

- Connect the pocket tester (DC 20V) to the horn connector at the horn terminal as shown.

Tester positive probe → black/white ①
Tester negative probe → ground



- Set the main switch to “ON”.
- Push the horn switch.
- Measure the voltage (12V) of black/white at the horn terminal.
- Is the voltage within specification?

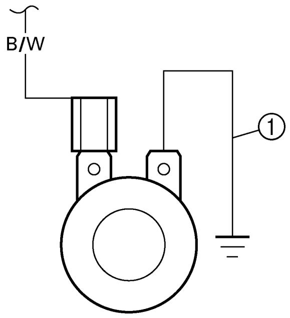
YES

NO

The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

3.Horn

- Disconnect the black connector at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Set the main switch to “ON”.
- Push the horn switch.
- Does the horn sound?



NO

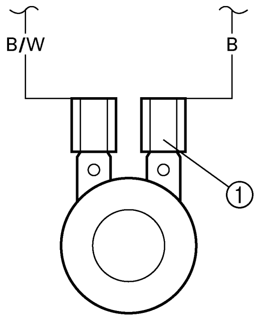
YES

The horn is OK.

4.Voltage

- Connect the pocket tester (DC 20V) to the horn connector at the black terminal as shown.

Tester positive probe → black ①
Tester negative probe → ground



- Set the main switch to “ON”.
- Measure the voltage (12V) of black ① at the horn terminal.
- Is the voltage within specification?

YES

NO

Repair or replace the horn.

Replace the horn.

EB806411

2. A tail/brake light fails to come on.

1.Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the tail/brake light bulb and socket OK?

YES NO

Replace the tail/brake light bulb, socket or both.

2.Brake light switches

- Check the brake light switches for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the brake light switch OK?

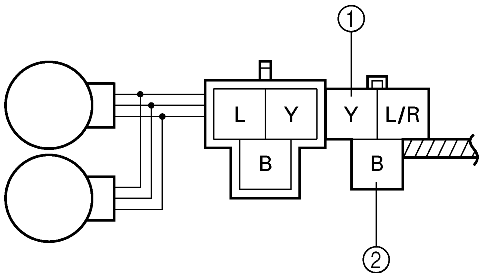
YES NO

Replace the brake light switch.

3.Voltage

- Connect the pocket tester (DC 20V) to the tail/brake light coupler (wire harness side) as shown.

Tester positive probe → yellow ①
Tester negative probe → black ②



- Set the main switch to “ON”.
- Pull in the brake lever or push down on the brake pedal.
- Measure the voltage (12 V) of yellow at the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

YES NO

This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EB806413

3. A turn signal light, turn signal indicator light or both fail to blink.

1.Turn signal light bulb and socket

- Check the turn signal light bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the turn signal light bulb and socket OK?

YES NO

Replace the turn signal light bulb, socket or both.

2.Turn signal indicator light LED

- Check the LED of the turn signal indicator light.
  Refer to “CHECKING THE LEDs”.
- Is the turn signal indicator light LED OK?

YES NO

Replace the meter assembly.

3.Turn signal switch

- Check the turn signal switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the turn signal switch OK?

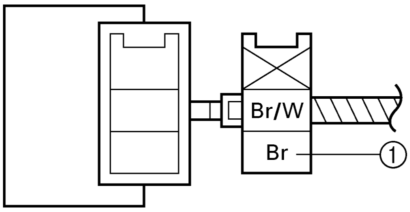
YES NO

Replace the left handlebar switch.

4.Voltage

- Connect the pocket tester (DC 20V) to the turn signal relay coupler (wire harness side) as shown.

Tester positive probe → brown ①
Tester negative probe → ground



- Set the main switch to “ON”.
- Measure the voltage (12V) of brown ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

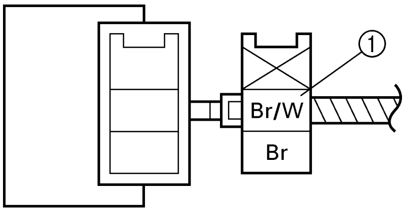
YES NO

The wiring circuit from the main switch to the turn signal relay coupler (turn signal relay side) is faulty and must be repaired.

5.Voltage

- Connect the pocket tester (DC 20V) to the turn signal relay coupler (wire harness side) as shown.

Tester positive probe → brown/white ①
Tester negative probe → ground



- Set the main switch to “ON”.
- Set the turn signal switch to “⇦” or “⇨”.
- Measure the voltage (12V) of brown/white at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES NO

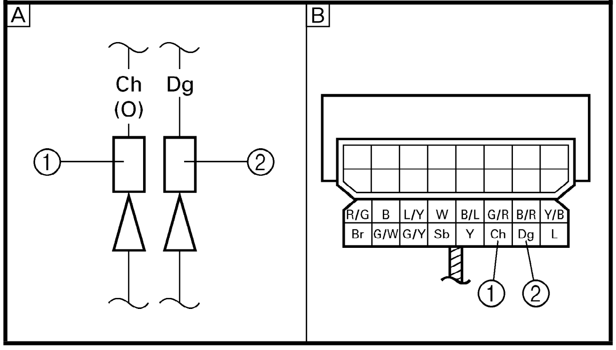
The turn signal relay is faulty and must be replaced.

6.Voltage

- Connect the pocket tester (DC 20V) to the turn signal light connectors or the meter assembly coupler (wire harness side) as shown.

A Turn signal light
B Turn signal indicator light

Left turn signal light
Tester positive probe → chocolate (orange) ①
Tester negative probe → ground
Right turn signal light
Tester positive probe → dark green ②
Tester negative probe → ground



- Set the main switch to “ON”.
- Set the turn signal switch to “⇦” or “⇨”.
- Measure the voltage (12V) of chocolate (orange) ① or dark green ② at the turn signal light connector (wire harness side).
- Is the voltage within specification?

⇩ YES ⬇ NO

This circuit is OK.

The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must be repaired.

EB806414

4. The neutral indicator light fails to come on.

1.Neutral indicator light LED

- Check the LED of the neutral indicator light.
  Refer to “CHECKING THE LEDs”.
- Is the neutral indicator light LED OK?

⇩ YES ⬇ NO

Replace the meter assembly.

2.Neutral switch

- Check the neutral switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the neutral switch OK?

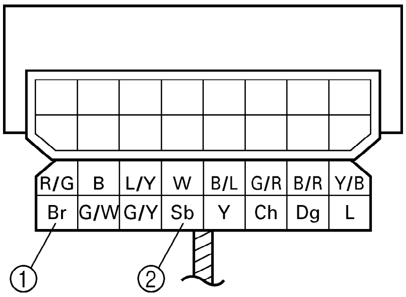
⇩ YES ⬇ NO

Replace the neutral switch.

3.Voltage

- Connect the pocket tester (DC 20V) to the meter assembly coupler (wire harness side) as shown.

Tester positive probe → brown ①
Tester negative probe → sky blue ②



- Set the main switch to “ON”.
- Measure the voltage (12 V) of brown ① and sky blue ② at the meter assembly coupler.
- Is the voltage within specification?

⇩ YES ⬇ NO

This circuit is OK.

The wiring circuit from the main switch to the meter light bulb coupler is faulty and must be repaired.

EB806416

5. The oil level warning light fails to come on.

1.Oil level warning light LED

- Check the LED of the oil level warning light.
  Refer to “CHECKING THE LEDs”.
- Is the oil level warning light LED OK?

⇩ YES ⬇ NO

Replace the meter assembly.

2.Oil level switch

- Drain the engine oil and remove the oil level switch from the oil pan.
- Check the oil level switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the oil level switch OK?

YES ⇩ NO ⬇

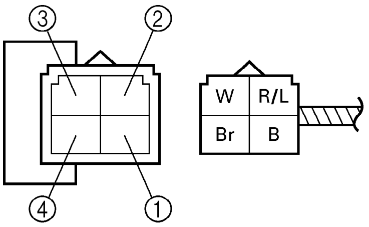
Replace the oil level switch.

3.Oil level relay

- Disconnect the oil level relay from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the oil level relay terminals as shown.

Battery positive terminal → brown ①
Battery negative terminal → white ②

Tester positive probe → red/blue ③
Tester negative probe → black ④



- Does the oil level relay have continuity between red/blue and black?

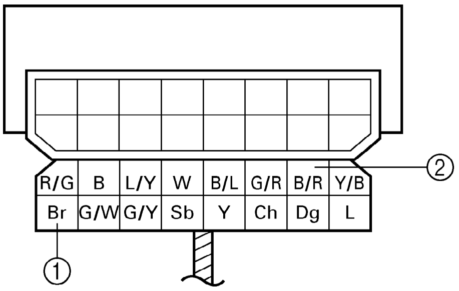
YES ⇩ NO ⬇

Replace the oil level relay.

4.Voltage

- Connect the pocket tester (DC 20V) to the meter assembly coupler (wire harness side) as shown.

Tester positive probe → brown ①
Tester negative probe → black/red ②



- Set the main switch to “ON”.
- Measure the voltage (12 V) of brown ① and black/red at the meter assembly coupler.
- Is the voltage within specification?

YES ⇩ NO ⬇

This circuit is OK.

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EB806417

6. The fuel level indicator light fails to come on.

1.Fuel level indicator light LED

- Check the LED of the fuel level indicator light.
  Refer to “CHECKING THE LEDs”.
- Is the fuel level indicator light LED OK?

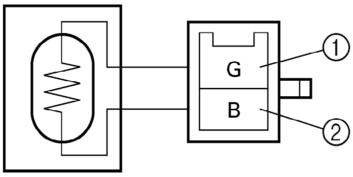
YES ⇩ NO ⬇

Replace the meter assembly.

2.Fuel sender

- Disconnect the fuel sender coupler from the wire harness.
- Drain the fuel from the fuel tank and remove the fuel sender from the fuel tank.
- Check the fuel sender for continuity.

Tester positive probe → green ①
Tester negative probe → black ②



- Is the fuel sender OK?

YES

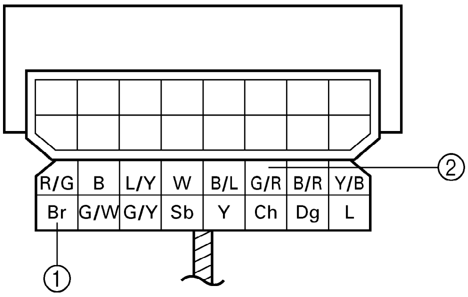
NO

Replace the fuel sender.

3.Voltage

Connect the pocket tester (DC 20V) to the meter assembly coupler (wire harness side) as shown.

Tester positive probe → brown ①
Tester negative probe → green/red ②



- Set the main switch to “ON”.
- Measure the voltage (12V).
- Is the voltage within specification?

YES

NO

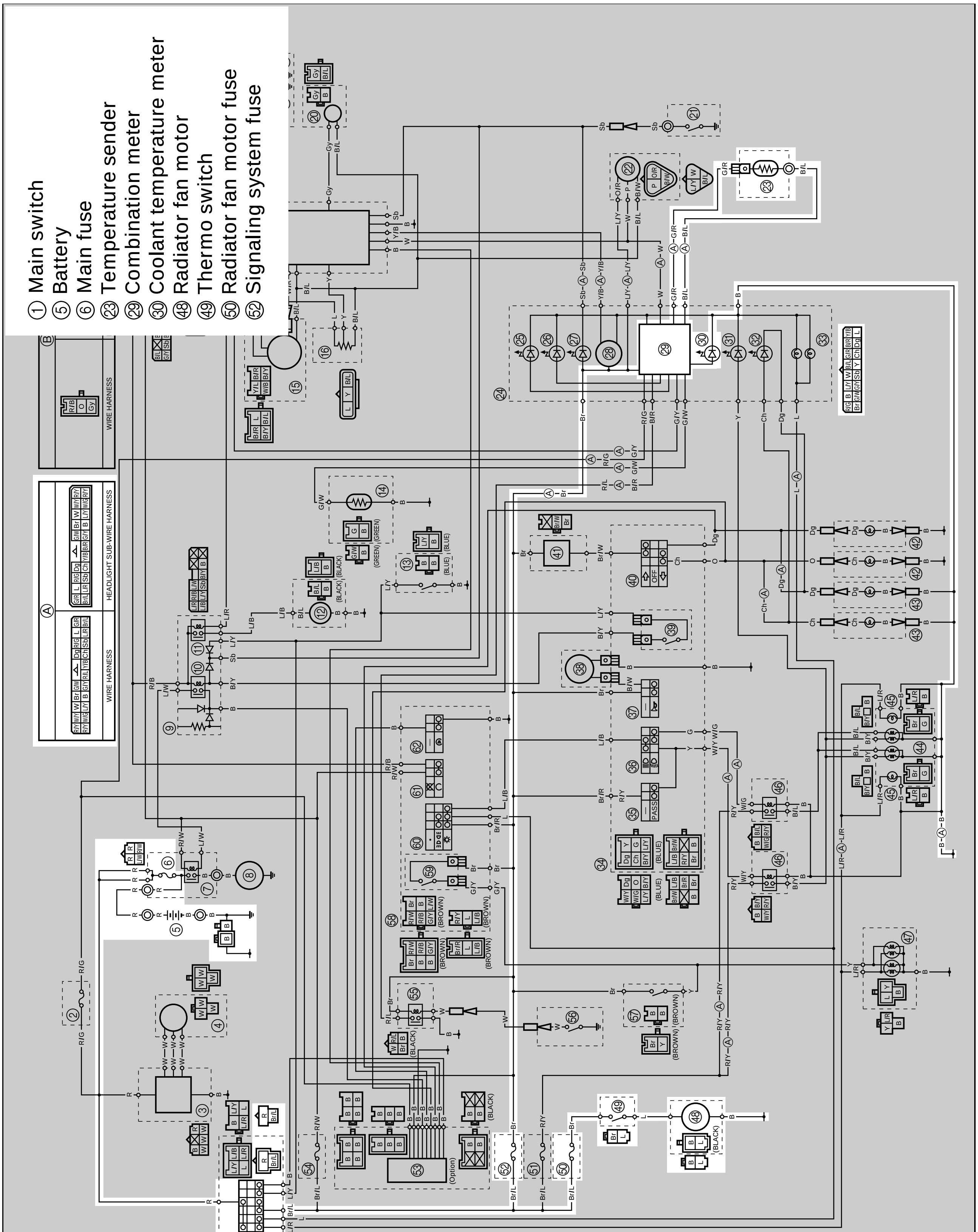
This circuit is OK.

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EB807000

COOLING SYSTEM

CIRCUIT DIAGRAM



① Main switch
⑤ Battery
⑥ Main fuse
㉓ Temperature sender
㉙ Combination meter
㉚ Coolant temperature meter
㊽ Radiator fan motor
㊾ Thermo switch
㊿ Radiator fan motor fuse
(52) Signaling system fuse

EB807010

TROUBLESHOOTING

- **The radiator fan motor fails to turn.**
- **The coolant temperature meter needle fails to move when the engine is warm.**

Check:

1. main, signal system, and radiator fan motor fuses
2. battery
3. main switch
4. radiator fan motor
5. thermo switch
6. temperature sender
7. wiring
   (the entire cooling system)

NOTE:

- Before troubleshooting, remove the following part(-s):
  1) rider seat
  2) bottom cowling
  3) front cowling inner panels
  4) left side cowling
  5) windshield
- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EB802400

1.Main, signal system and radiator fan motor fuses

- Check the main, signal system, and radiator fan motor fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main, signal system, and radiator fan motor fuses OK?

YES NO

Replace the fuse(-s).

EB802401

2.Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES NO

- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES NO

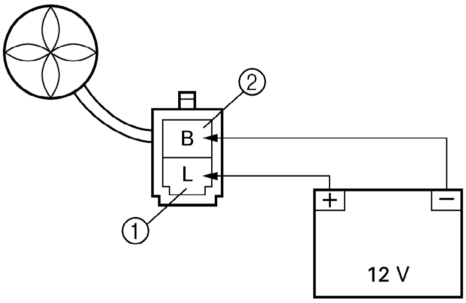
Replace the main switch.

EB807400

4.Radiator fan motor (test 1)

- Disconnect the radiator fan motor coupler from the wire harness.
- Connect the battery (12 V) as shown.

Battery positive lead → blue ①
Battery negative lead → black ②



- Does the radiator fan motor turn?

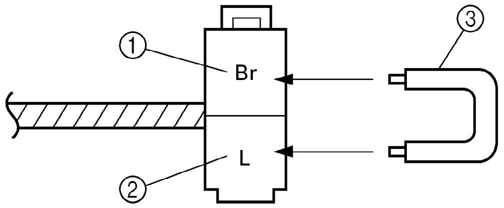
YES NO

The radiator fan motor is faulty and must be replaced.

EB807400

5.Radiator fan motor (test 2)

- Disconnect the thermo switch coupler.
- Set the main switch to “ON”.
- Connect the brown ① and blue ② terminals with a jumper lead ③ as shown.



- Does the radiator fan motor turn?

YES

NO

The wiring circuit from the main switch to the radiator fan motor coupler is faulty and must be repaired.

EB807402

6.Thermo switch

- Remove the thermo switch from the radiator.
- Connect the pocket tester (Ω × 1) to the thermo switch ① as shown.
- Immerse the thermo switch in a container filled with coolant ②.

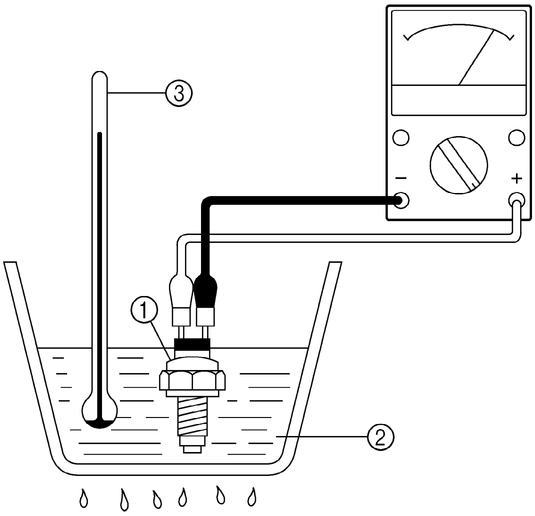
NOTE:

Make sure that the thermo switch terminals do not get wet.

- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, then let it cool to the specified temperature as indicated in the table.
- Check the thermo switch for continuity at the temperatures indicated in the table.

Test step	Coolant temperature	Continuity
	Thermo switch	
1	0 ~ 98 °C	NO
2	More than 105 ± 3 °C	YES
3*	105 to 98 °C	YES
4*	Less than 98 °C	NO

Test steps 1 & 2: Heating phase
Test steps 3* & 4*: Cooling phase

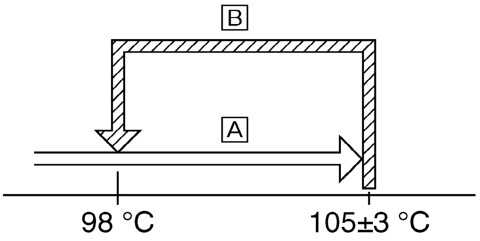


⚠ WARNING

- **Handle the thermo switch with special care.**
- **Never subject the thermo switch to strong shocks. If the thermo switch is dropped, replace it.**

Thermo switch
23 Nm (2.3 m • kg)
Three bond sealock® 10

Ⓐ The thermo switch circuit is open and the radiator fan is off.
Ⓑ The thermo switch circuit is closed and the radiator fan is on.



- Does the thermo switch operate properly as described above?

YES

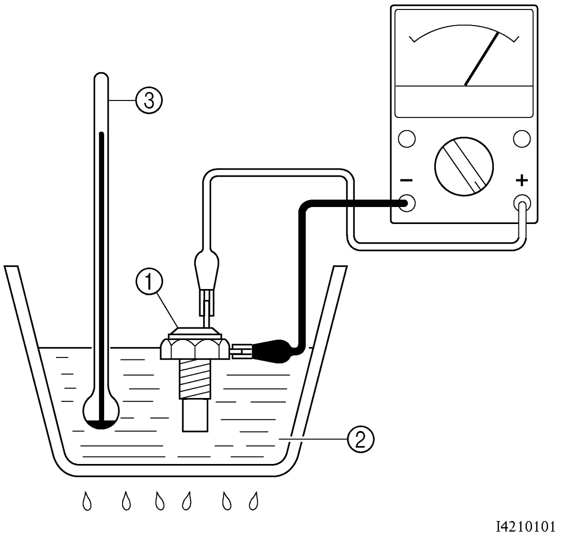
NO

Replace the thermo switch.

7.Temperature sender

- Remove the temperature sender from the radiator.
- Connect the pocket tester (Ω × 10) to the temperature sender ① as shown.
- Immerse the temperature sender in a container filled with water ②.
- Place a thermometer ③ in the water.
- Slowly heat the water, then let it cool down to the specified temperature.
- Check the temperature sender for continuity at the temperatures indicated below.

Temperature sender resistance
47.5 ~ 56.8 Ω at 80 ˚C
16.5 ~ 20.5 Ω at 115 ˚C



⚠ WARNING

Handle the temperature sender with special care.
Never subject the temperature sender to strong shocks. If the temperature sender is dropped, replace it.

Temperature sender
15 Nm (1.5 m • kg)
Three bond sealock® 10

YES

NO

Replace the temperature sender.

EB807403

8.Wiring

- Check the entire cooling system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the cooling system's wiring properly connected and without defects?

YES

NO

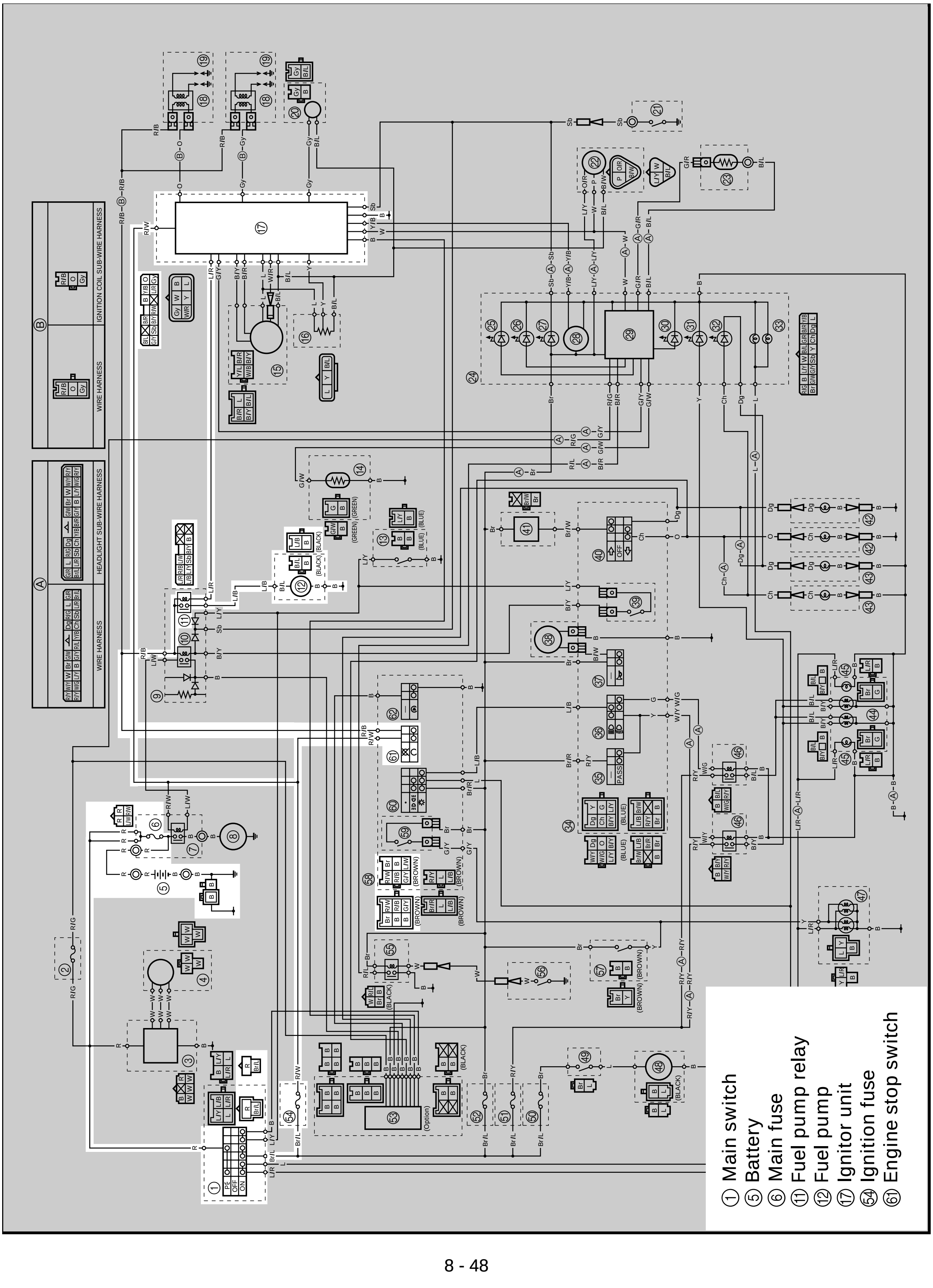
This circuit is OK.

Properly connect or repair the cooling system's wiring.

EB808000

FUEL PUMP SYSTEM

CIRCUIT DIAGRAM


WIRE HARNESS
HEADLIGHT SUB-WIRE HARNESS
WIRE HARNESS
IGNITION COIL SUB-WIRE HARNESS
Ⓐ
Ⓑ
PE
OFF
ON
(Option)
(BLACK)
(BROWN)
(BLUE)
(GREEN)
PASS

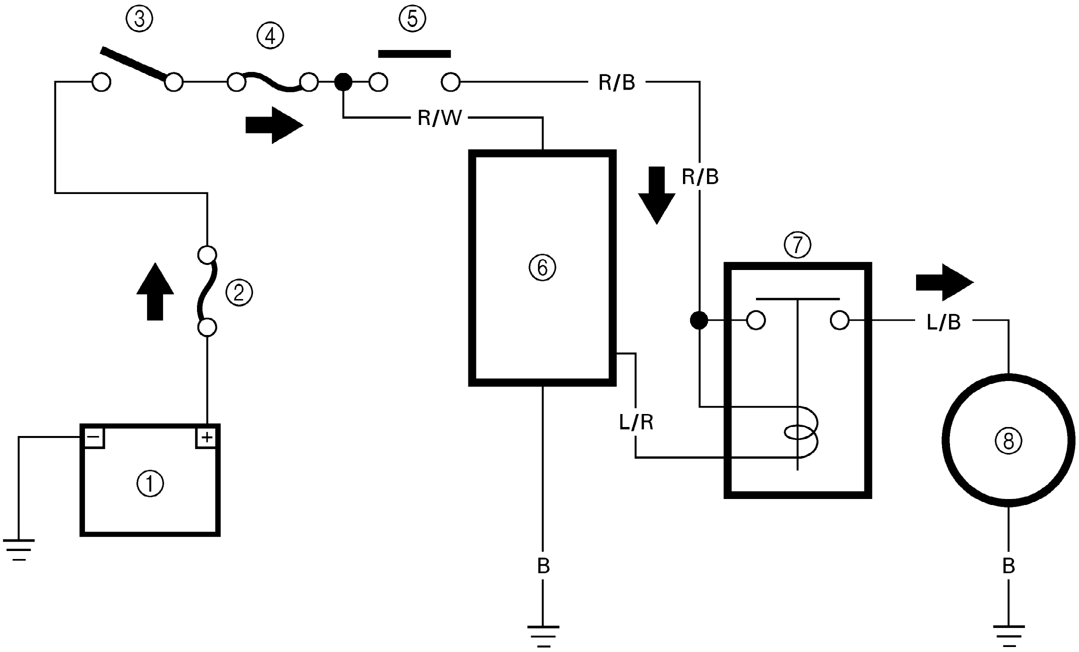
- ① Main switch
- ⑤ Battery
- ⑥ Main fuse
- ⑪ Fuel pump relay
- ⑫ Fuel pump
- ⑰ Ignitor unit
- (54) Ignition fuse
- (61) Engine stop switch

EB808010

FUEL PUMP CIRCUIT OPERATION

The ignitor unit includes the control unit for the fuel pump.

① Battery
② Main fuse
③ Main switch
④ Ignition fuse
⑤ Engine stop switch
⑥ Ignitor unit
⑦ Fuel pump relay
⑧ Fuel pump



EB808020

TROUBLESHOOTING

The fuel pump fails to operate.

Check:

1. main and ignition fuses
2. battery
3. main switch
4. engine stop switch
5. fuel pump relay
6. fuel pump
7. wiring
   (the entire fuel pump system)

NOTE:

- Before troubleshooting, remove the following part(-s):
1) rider seat
2) fuel tank
3) air filter case
4) front cowling inner panel (left)
- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EB802400

1.Main and ignition fuses

- Check the main and ignition fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and ignition fuses OK?

YES ⇩ NO ⬇

Replace the fuse(-s).

EB802401

2.Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES ⇩ NO ⬇

- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3.Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES ⇩ NO ⬇

Replace the main switch.

EB802412

4.Engine stop switch

- Check the engine stop switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

YES ⇩ NO ⬇

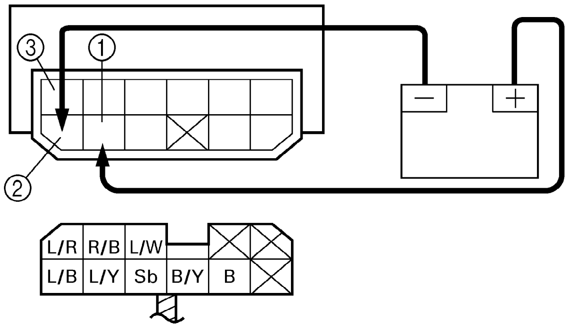
Replace the right handlebar switch.

5.Fuel pump relay

- Disconnect the relay unit from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the relay unit terminals as shown.

Battery positive terminal → red/black ①
Battery negative terminal → blue/red ②

Tester positive probe → red/black ①
Tester negative probe → blue/black ③



- Does the fuel pump relay have continuity between red/black and blue/black?

YES

NO

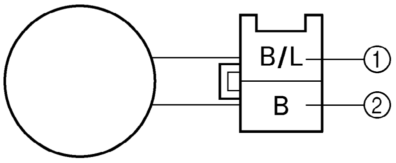
Replace the relay unit.

EB808400

6.Fuel pump resistance

- Disconnect the fuel pump coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the fuel pump coupler (fuel pump side) as shown.

Tester positive probe → black/blue ①
Tester negative probe → black ②



- Measure the fuel pump resistance.

Fuel pump resistance
4 ~ 30 Ω at 20 °C

- Is the fuel pump OK?

YES

NO

Replace the fuel pump.

EB808401

7.Wiring

- Check the entire fuel pump system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the fuel pump system's wiring properly connected and without defects?

YES

NO

Replace the ignitor unit.

Properly connect or repair the fuel pump system's wiring.

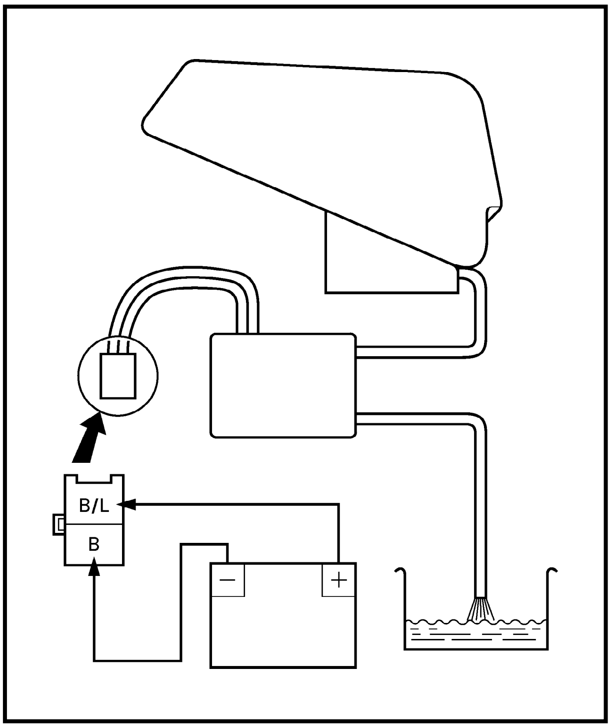
EB808410

CHECKING THE FUEL PUMP

WARNING

Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or fire. Be extremely careful and note the following points:

- **Stop the engine before refuelling.**
- **Do not smoke and keep away from open flames, sparks or any other source of fire.**
- **If you do accidentally spill gasoline, wipe it up immediately with dry rags.**
- **If gasoline touches the engine when it is hot, a fire may occur. Therefore, make sure that the engine is completely cool before performing the following test.**



1. Check:
   - fuel pump operation

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Fill the fuel tank.

b. Put the end of the fuel hose into an open container.

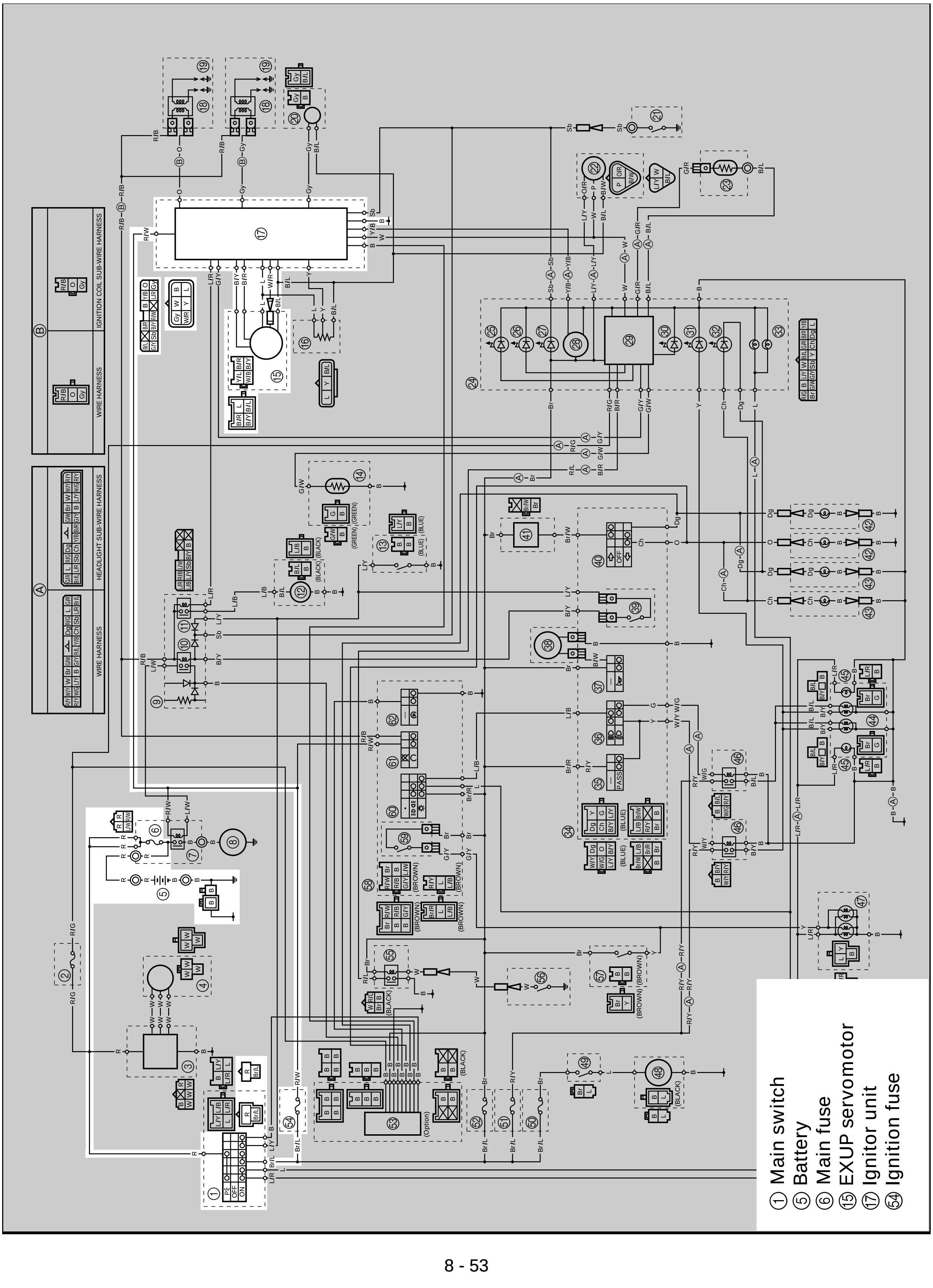
c. Connect the battery (12V) to the fuel pump coupler as shown.

Battery positive lead → blue/black ①
Battery negative lead → black ②

d. If fuel flows out of the fuel hose, the fuel pump is OK. If fuel does not flow, replace the fuel pump.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EB811000
EXUP SYSTEM
CIRCUIT DIAGRAM


WIRE HARNESS
HEADLIGHT SUB-WIRE HARNESS
IGNITION COIL SUB-WIRE HARNESS
(BLACK)
(BLUE)
(GREEN)
(BROWN)
(Option)
PASS
OFF

① Main switch
⑤ Battery
⑥ Main fuse
⑮ EXUP servomotor
⑰ Ignitor unit
(54) Ignition fuse

EB811010
TROUBLESHOOTING

When the engine speed changes, the EXUP servomotor does not operate.

Procedure 1

Check:
1. Exup servomotor operation
   (with the EXUP servomotor coupler connected to the wire harness)
2. voltage
3. Exup servomotor operation
4. (with the EXUP servomotor coupler disconnected from the wire harness)
5. Exup servomotor resistance
6. wiring
   (the entire EXUP system)

Procedure 2

Check:
1. main and ignition fuses
2. battery
3. main switch
4. engine stop switch
5. wiring
   (the entire EXUP system)

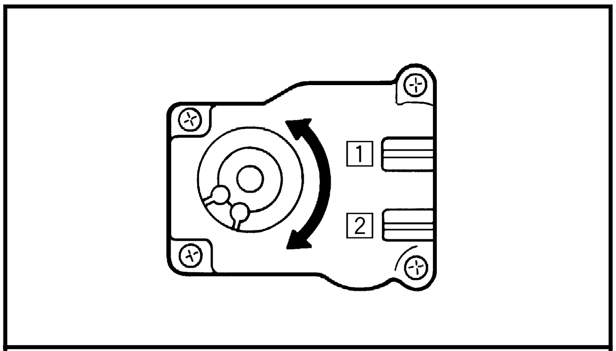
NOTE:
- Before troubleshooting, remove the following part(-s):
  1) rider seat
  2) fuel tank
  3) bottom cowling
- Troubleshoot with the special tool(-s).

Pocket tester
90890-03112

EB811400
Procedure 1

1.EXUP servomotor operation (with the EXUP servomotor coupler connected to the wire harness)

- Disconnect the EXUP cables from the EXUP servomotor pulley.
- Start the engine and rev it to 2,000 r/min.



- Does the EXUP servomotor pulley turn?

NO YES

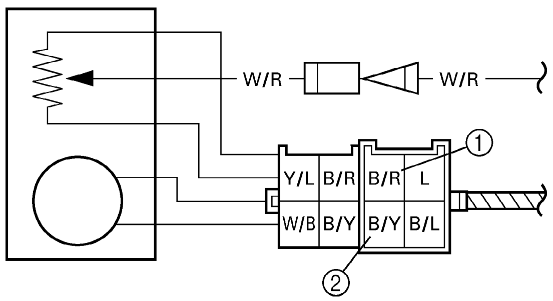
Check that the EXUP cables are properly installed. If OK, check the EXUP valve and cables. Refer to “ENGINE” in chapter 4.

EB811401

2.Voltage

- Connect the pocket tester (DC 20V) to the EXUP servomotor coupler (wire harness side) as shown.

Tester positive probe → black/red ①
Tester negative probe → black/yellow ②



- Set the main switch to “ON”.
- Measure the voltage (12V) between black/red ① and black/yellow ② (wire harness side).
- Is the voltage within specification?

YES NO

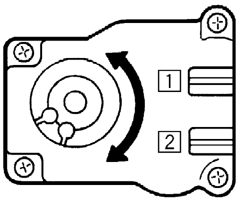
Go to Procedure 2.

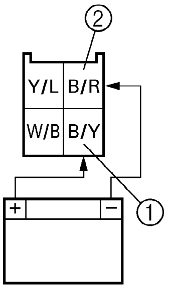
EB811402

3.EXUP servomotor operation (with the servomotor coupler disconnected from the wire harness)

- Disconnect the EXUP cables from the EXUP servomotor pulley.
- Disconnect the EXUP servomotor coupler from the wire harness.
- Connect the battery leads to the EXUP servomotor coupler (servomotor side) as shown.

Battery positive terminal → black/yellow ①
Battery negative terminal → black/red ②





- Check that the EXUP servomotor pulley rotates several times.

CAUTION:

To prevent damaging the EXUP servomotor, perform this test within a few seconds of connecting the battery.

- Does the EXUP servomotor pulley turn?

⇩ YES ⬇ NO

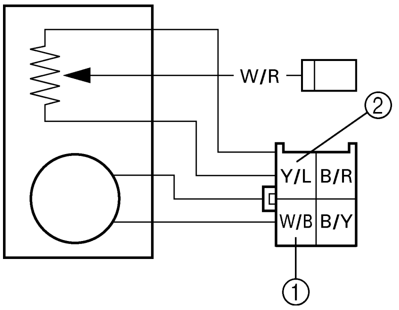
Replace the EXUP servomotor.

EB811403

4.EXUP servomotor resistance

- Disconnect the EXUP servomotor coupler from the wire harness.
- Connect the pocket tester (Ω × 1k) to the EXUP servomotor coupler.

Tester positive probe → white/black ①
Tester negative probe → yellow/blue ②

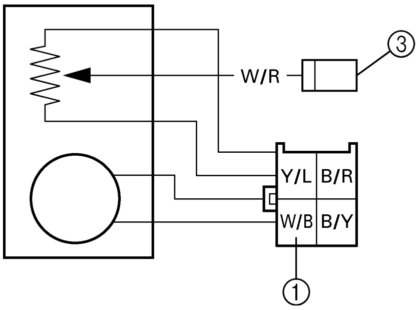


- Measure the EXUP servomotor resistance.

EXUP servomotor resistance
5.3 ~ 9.8 kΩ
(between white/black and yellow/blue)

- Connect the pocket tester (Ω × 1k) to the EXUP servomotor coupler.

Tester positive probe → white/black ①
Tester negative probe → white/red ③



- While slowly turning the EXUP servomotor pulley by hand, measure the EXUP servomotor resistance.

EXUP servomotor resistance (when the pulley is turned one full rotation)
0 ~ approximately 7.5 kΩ
(between white/black and white/red)

- Is the EXUP servomotor OK?

⇩ YES ⬇ NO

The EXUP servomotor is faulty and must be replaced.

EB811404

5.Wiring

- Check the entire EXUP system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the EXUP system’s wiring properly connected and without defects?

YES

Replace the ignitor unit.

NO

Properly connect or repair the EXUP system’s wiring.

EB811410

Procedure 2

EB802400

1.Main and ignition fuses

- Check the main and ignition fuses for continuity. Refer to “CHECKING THE FUSES” in chapter 3.
- Are the main and ignition fuses OK?

YES

NO

Replace the fuse(-s).

EB802401

2.Battery

- Check the condition of the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES

NO

- Clean the battery terminals.
- Recharge or replace the battery.

EB802411

3.Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES

NO

Replace the main switch.

EB802412

4.Engine stop switch

- Check the engine stop switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the engine stop switch OK?

YES

NO

Replace the right handlebar switch.

EB811411

5.Wiring

- Check the entire EXUP system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the EXUP system’s wiring properly connected and without defects?

YES

Go to “Procedure 1”.

NO

Properly connect or repair the EXUP system’s wiring.

EB812000

SELF-DIAGNOSIS

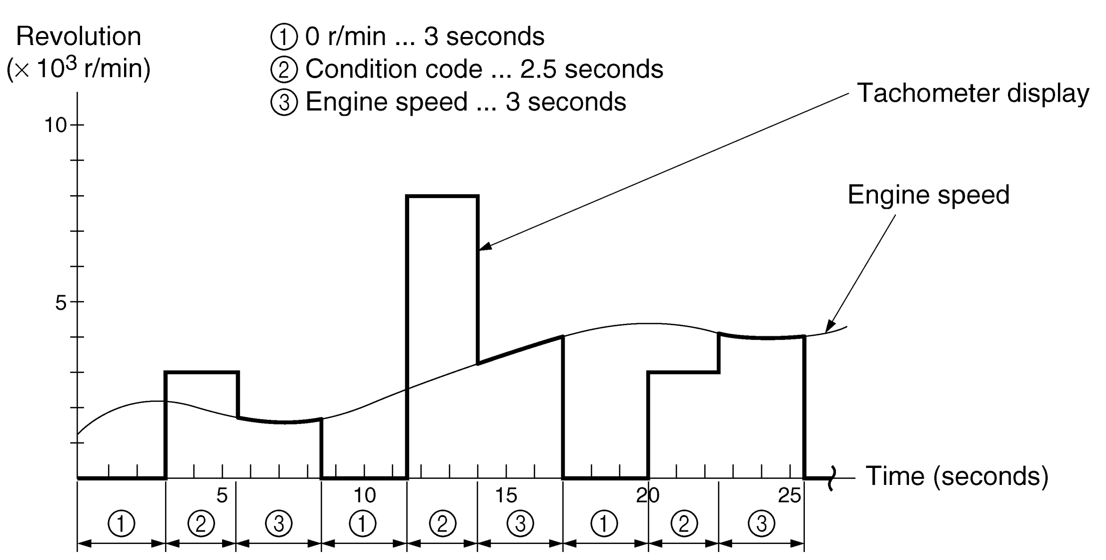
The YZF-R1 features a self-diagnosing system for the following circuit(-s):

- throttle position sensor
- EXUP
- fuel level indicator light

If any of these circuits are defective, their respective condition codes will be displayed on the tachometer when the main switch is set to "ON" (irrespective of whether the engine is running or not)

Circuit	Defect(-s)	System response	Condition code
Throttle position sensor	• Disconnected • Short-circuit • Locked	• The ignitor unit stays set to the wide-open throttle ignition timing. The motorcycle can be ridden. • The tachometer displays the condition code.	3,000 r/min
EXUP	• Improper connection • Short-circuit	• The EXUP valve stays in the open position for three seconds and then the servomotor shuts off. The motorcycle can be ridden. • The tachometer displays the condition code.	7,000 r/min
	• Servomotor is locked.	• The servomotor's power supply is constantly interrupted so that it will not burn out. The motorcycle can be ridden. • The tachometer displays the condition code.	
Fuel level indicator light	• Improper connection	• The tachometer displays the condition code.	8,000 r/min

Tachometer display sequence



When more than one item is being monitored, the tachometer needle displays the condition codes in ascending order, cycling through the sequence repeatedly.

If the engine is stopped, the engine speed ③ is 0 r/min.

EB812010

TROUBLESHOOTING

The tachometer starts to display the self-diagnosis sequence.

Check:

1. throttle position sensor
2. Exup
3. fuel level indicator light

NOTE:

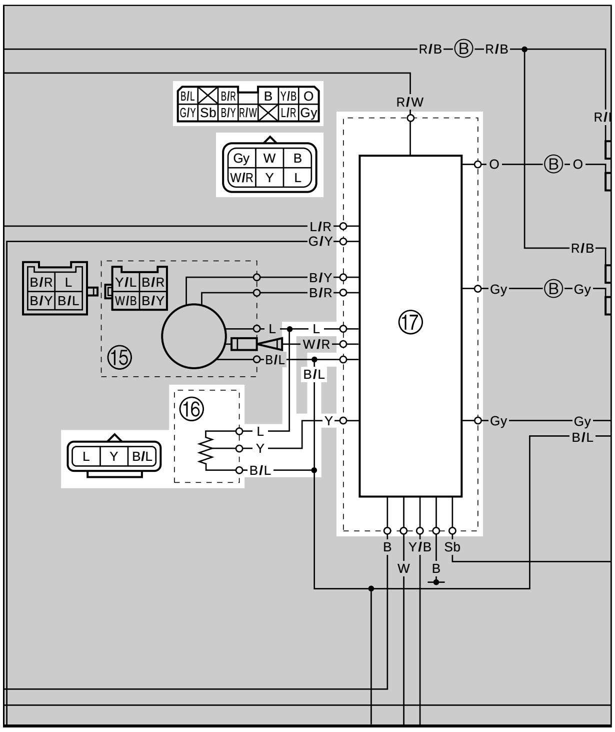
- Before troubleshooting, remove the following part(-s):
  1) rider seat
  2) fuel tank
  3) air filter case
- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EB812020

1. Throttle position sensor

CIRCUIT DIAGRAM


R/B
B
R/B
R/W
B/L
B/R
B
Y/B
O
G/Y
Sb
B/Y
R/W
L/R
Gy
Gy
W
B
W/R
Y
L
O
B
O
L/R
G/Y
R/B
B/R
L
B/Y
B/L
Y/L
B/R
W/B
B/Y
B/Y
B/R
Gy
B
Gy
L
L
W/R
B/L
B/L
⑰
⑮
⑯
L
Y
B/L
Y
Gy
Gy
B/L
L
Y
B/L
B
Y/B
Sb
W
B

⑯ Throttle position sensor
⑰ Ignitor unit

1.Wire harness

- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".
- Is the wire harness OK?

YES

NO

Repair or replace the wire harness.

EB812401

2.Throttle position sensor

- Check the throttle position sensor for continuity.
  Refer to "CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR" in chapter 6.
- Is the throttle position sensor OK?

YES

NO

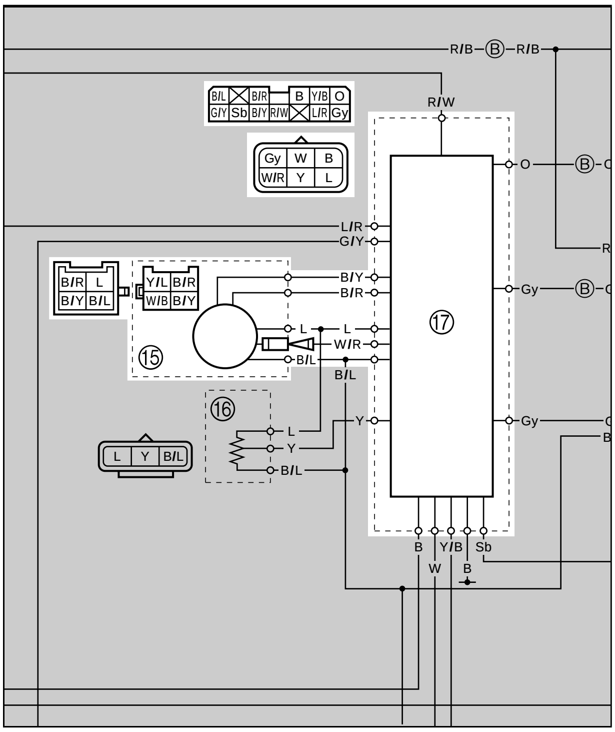
Replace the ignitor unit.

Replace the throttle position sensor.

EB812030

2. EXUP

CIRCUIT DIAGRAM


R/B
B
R/B
R/W
B/L
B/R
B
Y/B
O
G/Y
Sb
B/Y
R/W
L/R
Gy
Gy
W
B
W/R
Y
L
O
B
R
L/R
G/Y
B/R
L
B/Y
B/L
Y/L
B/R
W/B
B/Y
B/Y
B/R
Gy
B
⑰
L
L
W/R
B/L
⑮
B/L
⑯
Y
Gy
B
L
Y
B/L
L
Y
B/L
B
Y/B
Sb
W
B

⑮ EXUP servomotor
⑰ Ignitor unit

EB812400

1.Wire harness

- Check the wire harness for continuity.
  Refer to “CIRCUIT DIAGRAM”.
- Is the wire harness OK?

⇩ YES

⬇ NO

Repair or replace the wire harness.

EB812402

2.EXUP servomotor

- Check the EXUP servomotor for continuity.
  Refer to “EXUP SYSTEM”.
- Is the EXUP servomotor OK?

⇩ YES

Replace the ignitor unit.

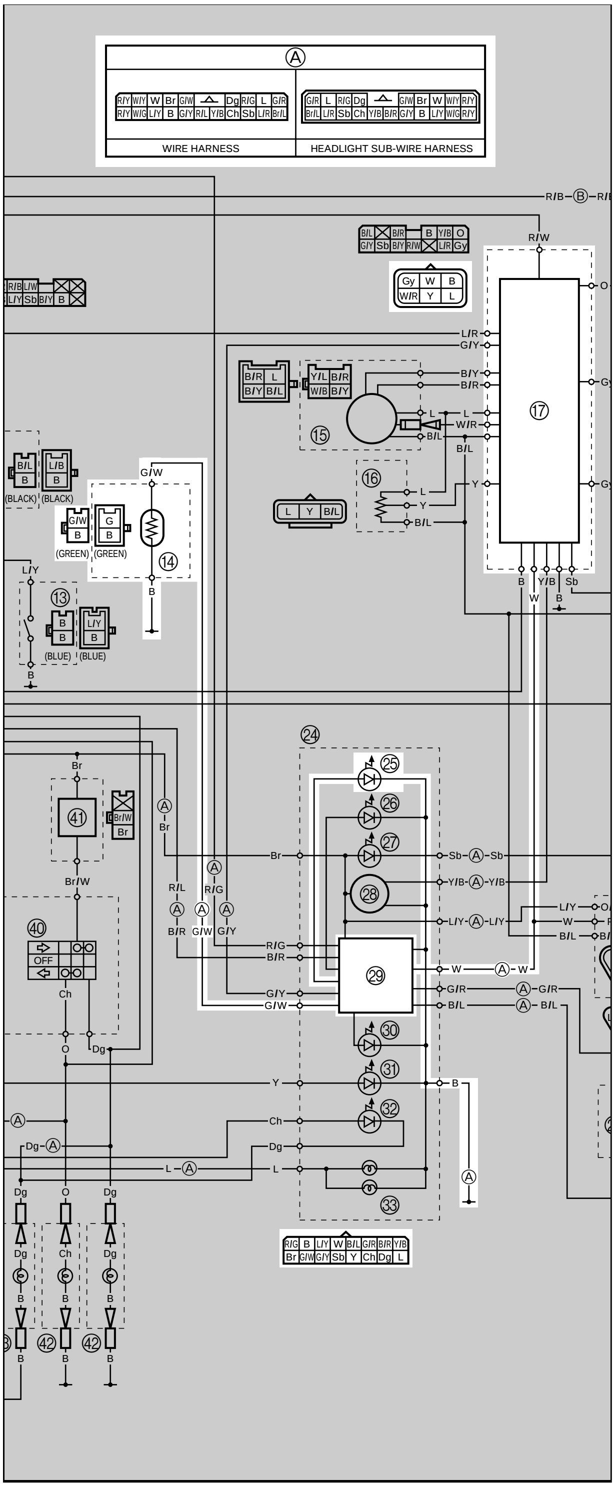
⬇ NO

Replace the EXUP servomotor.

EB812040

3. Fuel level indicator light

CIRCUIT DIAGRAM


Ⓐ
WIRE HARNESS
HEADLIGHT SUB-WIRE HARNESS
⑬
⑭
⑮
⑯
⑰
㉔
㉕
㉖
㉗
㉘
㉙
㉚
㉛
㉜
㉝
㊵
㊶
㊷
(BLACK)
(GREEN)
(BLUE)
OFF

⑭ Fuel sender

⑰ Ignitor unit

㉕ Fuel level indicator light

㉙ Combination meter

EB812403

1.Fuel level indicator light LED

- Check the LED of the fuel level indicator light.
  Refer to “CHECKING THE LEDs”.
- Is the fuel level indicator light LED OK?

YES NO

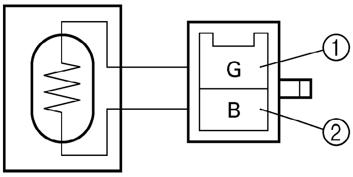
Repair the fuel level indicator light LED.

EB812404

2.Fuel sender

- Disconnect the fuel sender coupler from the wire harness.
- Connect the pocket tester (W × 1) to the fuel sender coupler as shown.

Tester positive probe → green ①
Tester negative probe → black ②



- Check the fuel sender for continuity.
- Is the fuel sender OK?

YES NO

Replace the fuel sender.

EB812405

3.Wire harness

- Check the wire harness for continuity.
  Refer to “CIRCUIT DIAGRAM”.
- Is the wire harness OK?

YES: Replace the ignitor unit.

NO: Replace or replace the wire harness.

?

TRBL
SHTG

9

CHAPTER 9.
TROUBLESHOOTING

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EB900000

TROUBLESHOOTING

NOTE:
The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

STARTING PROBLEMS

ENGINE

Cylinders and cylinder head(-s)
- Loose spark plug
- Loose cylinder head
- Damaged cylinder head gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Incorrectly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

Pistons and piston rings
- Incorrectly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter
- Incorrectly installed air filter
- Clogged air filter element

Crankcase and crankshaft
- Incorrectly assembled crankcase
- Seized crankshaft

FUEL SYSTEM

Fuel tank
- Empty fuel tank
- Clogged fuel filter
- Clogged fuel tank breather hose
- Clogged rollover valve (California only)
- Clogged rollover-valve-to-fuel-tank hose (California only)
- Deteriorated or contaminated fuel

Fuel pump
- Faulty fuel pump
- Faulty fuel pump relay

Fuel cock
- Clogged or damaged fuel hose

Carburetors
- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Damaged float
- Worn needle valve
- Incorrectly installed needle valve seat
- Incorrect fuel level
- Incorrectly installed pilot jet
- Clogged starter jet
- Faulty starter plunger
- Incorrectly adjusted starter cable

ELECTRICAL SYSTEMS

Battery
- Faulty battery
- Discharged battery

Fuses
- Blown, damaged or incorrect fuse
- Incorrectly installed fuse

Spark plugs
- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coils
- Damaged ignition coil
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system
- Faulty ignitor unit
- Faulty pickup coil

Switches and wiring
- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty sidestand switch
- Faulty clutch switch
- Incorrectly grounded circuit
- Loose connections

Starting system
- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cutoff relay
- Faulty starter clutch

EB901000

INCORRECT ENGINE IDLING SPEED

ENGINE

Cylinders and cylinder head

- Incorrect valve clearance
- Damaged valve train components

Air filter

- Clogged air filter element

FUEL SYSTEM

Carburetors

- Faulty starter plunger
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Incorrectly synchronized carburetors
- Incorrectly adjusted engine idling speed (throttle stop screw)
- Incorrect throttle cable free play
- Flooded carburetor

ELECTRICAL SYSTEMS

Battery

- Faulty battery
- Discharged battery

Spark plugs

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coils

- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Damaged ignition coil

Ignition system

- Faulty ignitor unit
- Faulty pickup coil

EB902000

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING PROBLEMS”.

ENGINE

Air filter

- Clogged air filter element

FUEL SYSTEM

Carburetors

- Faulty diaphragm
- Incorrect fuel level
- Loose or clogged main jet

Fuel pump

- Faulty fuel pump

EB903000

FAULTY GEAR SHIFTING

SHIFTING IS DIFFICULT

Refer to “CLUTCH DRAGS”.

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Incorrectly adjusted shift rod
- Bent shift shaft.

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Foreign object between transmission gears
- Incorrectly assembled transmission

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Incorrectly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

EB904000

FAULTY CLUTCH

CLUTCH SLIPS

Clutch

- Incorrectly assembled clutch
- Incorrectly adjusted clutch cable
- Loose or fatigued clutch spring
- Worn friction plate
- Worn clutch plate

Engine oil

- Incorrect oil level
- Incorrect oil viscosity (low)
- Deteriorated oil

CLUTCH DRAGS

Clutch

- Unevenly tensioned clutch spring plate
- Warped pressure plate
- Bent clutch plate
- Swollen friction plate
- Bent clutch pull rod
- Damaged clutch boss
- Burnt primary driven gear bushing
- Match marks not aligned

Engine oil

- Incorrect oil level
- Incorrect oil viscosity (high)
- Deteriorated oil

EB905001

OVERHEATING

ENGINE

Clogged coolant passages

Cylinder head(-s) and piston(-s)

- Heavy carbon buildup

Engine oil

- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

COOLING SYSTEM

Coolant

- Low coolant level

Radiator

- Damaged or leaking radiator
- Faulty radiator cap
- Bent or damaged radiator fin

Water pump

- Damaged or faulty water pump

Thermostat

- Thermostat stays closed

Oil cooler

- Clogged or damaged oil cooler

Hoses and pipes

- Damaged hose
- Incorrectly connected hose
- Damaged pipe
- Incorrectly connected pipe

FUEL SYSTEM

Carburetors

- Incorrect main jet setting
- Incorrect fuel level
- Damaged or loose carburetor joint

Air filter

- Clogged air filter element

CHASSIS

Brakes

- Dragging brake

ELECTRICAL SYSTEMS

Spark plugs

- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system

- Faulty ignitor unit

EB906000

OVERCOOLING

COOLING SYSTEM

Thermostat

- Thermostat stays open

EB907000

POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper piston seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EB908001

FAULTY FRONT FORK LEGS

LEAKING OIL

- Bent, damaged or rusty inner tube
- Damaged outer tube
- Incorrectly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod assembly bolt
- Damaged damper rod assembly bolt copper washer
- Damaged cap bolt O-ring

MALFUNCTION

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EB909001

UNSTABLE HANDLING

Handlebars

- Bent or incorrectly installed right handlebar
- Bent or incorrectly installed left handlebar

Steering head components

- Incorrectly installed upper bracket
- Incorrectly installed lower bracket (incorrectly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork legs

- Unevenoil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Damaged fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Swingarm

- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly

- Faulty rear shock absorber spring
- Leaking oil or gas

Tires

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheels

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Incorrectly installed bearing race

EB910000

FAULTY LIGHTING AND SIGNALING SYSTEMS

HEADLIGHT DOES NOT LIGHT

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Incorrectly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

HEADLIGHT BULB BURNT OUT

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Incorrectly grounded circuit
- Faulty main switch
- Faulty light switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT LIGHT

- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

TAIL/BRAKE LIGHT BULB BURNT OUT

- Wrong tail/brake light bulb
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

TURN SIGNAL DOES NOT LIGHT

- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Incorrectly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

TURN SIGNAL BLINKS SLOWLY

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Wrong turn signal bulb

TURN SIGNAL REMAINS LIT

- Faulty turn signal relay
- Burnt-out turn signal bulb

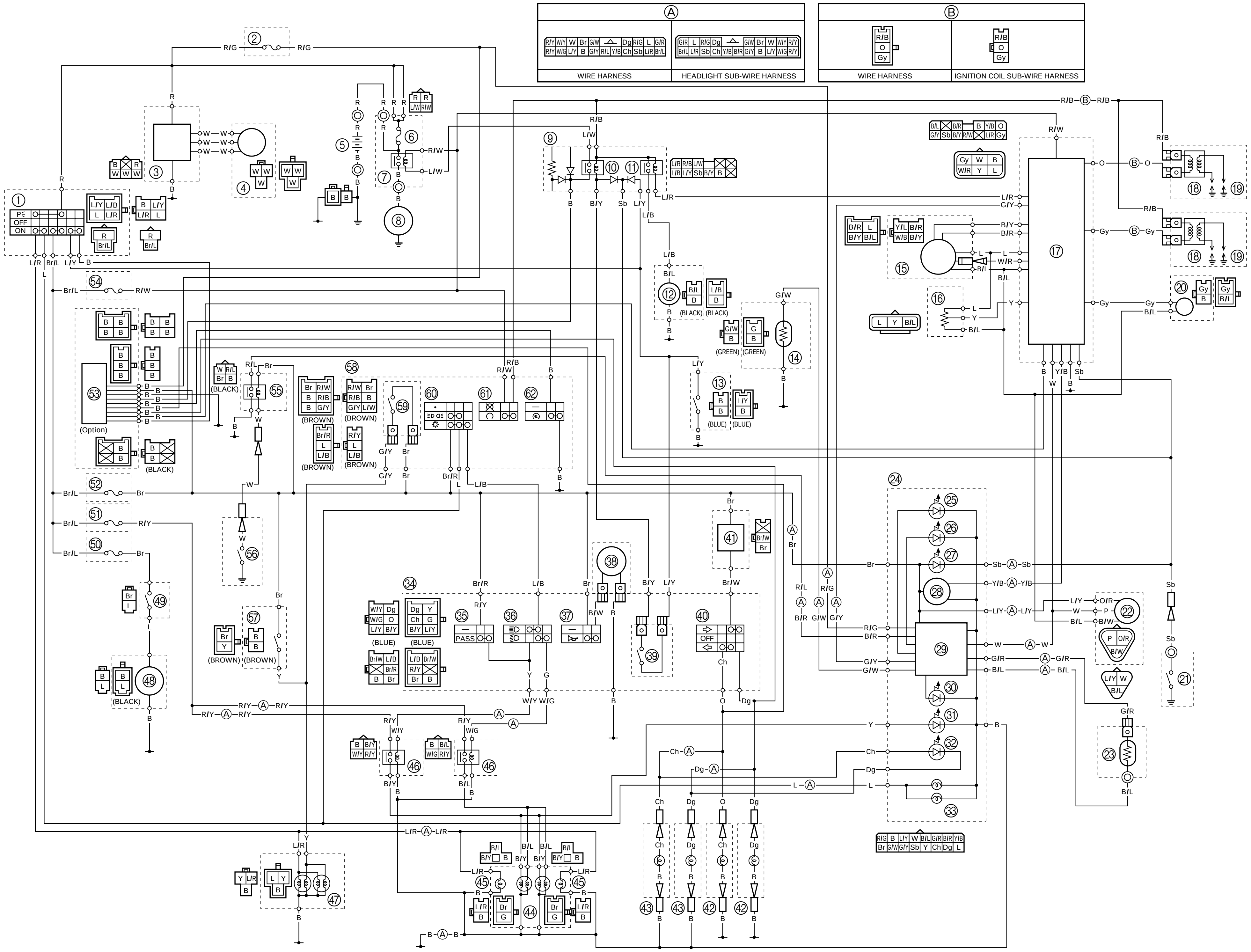
TURN SIGNAL BLINKS QUICKLY

- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

HORN DOES NOT SOUND

- Incorrectly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

YZF-R1 WIRING DIAGRAM



① Main switch
② Backup fuse (odometer)
③ Rectifier/regulator
④ Generator
⑤ Battery
⑥ Main fuse
⑦ Starter relay
⑧ Starter motor
⑨ Relay unit
⑩ Starting circuit cutoff relay
⑪ Fuel pump relay
⑫ Fuel pump
⑬ Sidestand switch
⑭ Fuel sender
⑮ EXUP servomotor
⑯ Throttle position sensor
⑰ Ignitor unit
⑱ Ignition coil
⑲ Spark plug
⑳ Pickup coil
㉑ Neutral switch
㉒ Speed sensor
㉓ Temperature sender
㉔ Meter assembly
㉕ Fuel level indicator light
㉖ Oil level warning light
㉗ Neutral indicator light
㉘ Tachometer
㉙ Combination meter
㉚ Coolant temperature meter
㉛ High beam indicator light
㉜ Turn signal indicator light
㉝ Meter light
㉞ Left handlebar switch
㉟ Pass switch
㊱ Dimmer switch
㊲ Horn switch
㊳ Horn
㊴ Clutch switch
㊵ Turn signal switch
㊶ Turn signal relay
㊷ Rear turn signal light
㊸ Front turn signal light
㊹ Headlight
㊺ Auxiliary light
㊻ Headlight relay
㊼ Tail/brake light
㊽ Radiator fan motor
㊾ Thermo switch
㊿ Radiator fan motor fuse
(51) Headlight fuse
(52) Signaling system fuse
(53) CYCLELOCK (option)
(54) Ignition fuse
(55) Oil level relay
(56) Oil level switch
(57) Rear brake light switch
(58) Right handlebar switch
(59) Front brake light switch
(60) Lights switch
(61) Engine stop switch
(62) Start switch

COLOR CODE

B .... black
Br .... brown
Ch .... chocolate
Dg .... dark green
G .... green
Gy .... gray
L .... blue
O .... orange
P .... pink
R .... red

Sb .... sky blue
W .... white
Y .... yellow
B/L .... black/blue
B/R .... black/red
B/W .... black/white
B/Y .... black/yellow
Br/L .... brown/blue
Br/R .... brown/red
Br/W ...... brown/white

G/R .... green/red
G/W ...... green/white
G/Y .... green/yellow
L/B .... blue/black
L/R .... blue/red
L/W .... blue/white
L/Y .... blue/yellow
O/R .... orange/red
R/B .... red/black
R/G .... red/green

R/L .... red/blue
R/W .... red/white
R/Y .... red/yellow
W/B .... white/black
W/G .... white/green
W/Y .... white/yellow
Y/B .... yellow/black
Y/L .... yellow/blue